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DRINKING DRIVING
COUNTERATTACK

A joint program of the Ministry of Attorney General and
the Insurance Corporation of British Columbia.

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THE COUNTERATTACK PROGRAM

THE MEASUREMENT OF "ALCOHOL INVOLVEMENT"

PUBLIC OPINION ON AND KNOWLEDGE OF DRINKING DRIVING

DRIVER AGE AND CASUALTY TRAFFIC ACCIDENTS

VICTIMS OF TRAFFIC ACCIDENTS

LOCATIONS AND CAUSES OF TRAFFIC ACCIDENTS

DRINKING DRIVING ROADCHECK "BLITZES"

RESTRAINT DEVICE USE STUDIES

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British Columbia

February, 1985.

NOTE

The views expressed in this publication are entirely those of the writer and do not nesessarily represent the views or policies of the Ministry of Attorney General or the province of British Columbia.

OTHER COUNTERATTACK PUBLICATIONS

The Characteristics of Night-Time Drivers in British Columbia, Ministry of Attorney General, British Columbia, 1982.

This study examined the demographic characteristics, seat belt use and Blood Alcohol Content (BAC) of a representative sample of night-time drivers in

Driving While Impaired: Drivers, Charges and Outcomes, Ministry of Attorney General, British Columbia, 1983.

This study examined the court and driving records of 1,531 drivers charged with Driving While Impaired under the Canadian Criminal Code. These drivers were examined in terms of their demographic characteristics, past driving histories method of apprehension, Blood Alcohol Content (BAC) at the time of arrest, and the outcome of their court appearances. In addition, their demographic and BAC characteristics were compared to those of a representative sample of drivers in British Columbia in order to assess any differences between those persons driving while impaired and those apprehended for same. 49 pp.

Alcohol-Related Casualty Traffic Accidents in British Columbia, Ministry of Attorney General, British Columbia, 1984.

This document is a collection of studies which examined the characteristics of alcohol-related casualty traffic accidents in terms of their costs, causes, trends, locations, circumstances, and driver age and experience. 116 pp. (See also Appendix A herein.)

These publications are available by writing:

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Director of Research
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FOREWORD

This document is a collection of selected papers produced by the CounterAttack Program, most of which have been prevoiusly distributed on a limited basis. They have been selected for inclusion not only because they represent the sort of work done by CounterAttack research, but also because they address topics which have been of general interest not only to traffic safety reserachers, but also to the police, policy makers, and the general public. While each paper is complete onto itself, they have been organized into the following broad categories:

THE COUNTERATTACK PROGRAM

THE MEASUREMENT OF "ALCOHOL INVOLVEMENT"

PUBLIC OPINION ON AND KNOWLEDGE OF DRINKING DRIVING

DRIVER AGE AND CASUALTY TRAFFIC ACCIDENTS

VICTIMS OF TRAFFIC ACCIDENTS

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DRINKING DRIVING ROADCHECK "BLITZES"

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EXECUTIVE SUMMARIES

THE COUNTERATTACK PROGRAM

CounterAttack is a joint program of the Ministry of Attorney General and the Insurance Corporation of British Columbia with a combined budget of $600,000. per year. Its purpose is to reduce drinking driving casualties through programs of visible police enforcement, public information and education, and research and evaluation. It is estimated that CounterAttack has kept alcohol-related casualty accidents to about 10% less than would be expected without the program, and this in turn results in a yearly savings of about 30 lives, 850 injuries and $10 million which would otherwise be paid out in insurance, hospital and justice system costs.

THE MEASUREMENT OF "ALCOHOL INVOLVEMENT"

Using American police and coroners' reports, J.C. Fell in Tracking the Alcohol Involvement Problem in U.S. Highway Crashes (27th Annual Proceedings, American Association for Automotive Medicine, 1983) notes that when the police designate a driver to have alcohol involvement, they are in error about 5% of the time. He also indicates that, using both coroner and police data in combination, nationally alcohol was involved in 55-58% of fatal accidents, 17% of injury only accidents, 8% of property damage only accidents, and 11% of all accidents. However, the problem of the role of alcohol and how it relates to these figures is still unanswered. The presence or absence of alcohol, except at very high BAC levels, does not necessarily guarantee it a role in the cause of the accident. It is clear from this discussion that the police, when judging the role of alcohol as a contributing factor to casualty traffic accidents, produce figures which are less than those which speak to the presence or absence of alcohol, and that their figures on causation show a greater difference for fatal accidents (which comprise about 2% of their accident investigation burden) than for injury only accidents (which comprise about 98% of their accident investigation burden).

While it is important to more precisely determine the magnitude of the difference between the police judgement of alcohol as a causative factor and the presence of alcohol-- and this can only be done through ongoing hospital and coroner studies-- two things can be suggested concerning alcohol as a significant contributing factor in casualty accidents as indicated on the Traffic Accident Report Form (MV104) completed by the attending police officers at these accidents. First, that the MV104 data can probably be taken as an accurate (i.e. reliable and valid) indicator of changes in the rate of alcohol involvement over time. And second, that the police data are probably a reasonabe indicator of both the role and presence of alcohol in injury only accidents, however can only be seen as a measure of causative the role, not absolute chemical presence or level, of alcohol in fatal traffic accidents.

Finally, while studies tend to show that the police, when asked, are around 90% accurate in their judgement of the presence or absence of alcohol, perhaps the only way to determine this level of accuracy for the B.C. police forces is to change the MV104 so that they are required not only to judge whether or not alcohol played a significant role in the accident under investigation, but also to judge its presence as well.

PUBLIC OPINIONS ON AND KNOWLEDGE OF DRINKING DRIVING

The following is an overview of a British Columbia wide telephone survey of persons over 15 years of age, done in order to investigate their opinions and beliefs concerning drinking driving. The survey was designed by the CounterAttack Program and was carried out by MarkTrend, an independent research firm. The highlights are:

* The respondents realized that people are more likely to be in a traffic accident if they have been drinking than if they have not.

* The respondents underestimated the liklihood of being convicted if charged with Driving While Impaired (DWI).

* The CounterAttack "BATmobile" and "call the police" television messages were the most frequently mentioned anti-drinking driving messages.

* When asked to name groups or organizations associated with drinking driving, the most frequently mentioned group was Mothers Against Drunk Driving (MADD), followed by the Government, the Police, and, all tied, CounterAttack, ALcoholics Anonymous, and citizens groups.

* About a third of the respondents admitted to being a drinking driver or a passenger with one in the previous month, and 7% admitted to having at some time been charged with DWI.

* When asked what should be done in order to reduce drinking driving, the respondents suggested increased penalties, increased apprehension rates, and increased education, in that order. Generally, the penalties suggested involved licence suspension, jail terms, and fines, all in excess of currently used levels. However, there was a clear distinction made among different offence consequences. For example, the average fine suggested for a first offence was $849.00, for a second offence, $1,234.00, for causing an accident without injury, $1,121.00, and for causing an accident producing injury or death, $2,572.00.

* About 85% thought that drinking driving was a very serious or extremely serious problem.

* Over 90% could correctly estimate the number of drinks that it would take an average person to become legally impaired.

* About 70% had no idea of the penalties for a DWI first offence, and of the remainder, not one person could correctly name the penalties.

DRIVER AGE AND CASUALTY TRAFFIC ACCIDENTS

The Relationship between Drivers' Age and Seven Commonly Cited Contirbuting Factors to Casualty Traffic Accidents, British Columbia, 1982

It is clear that the contributing factors to casualty traffic accidents varied from age group to age group. Specifically, Driving Without Due Care, Unsafe Speed, Alcohol Involvement, and Vehicle Fault were more frequently cited for younger drivers than for older drivers. For drivers between 26-50 years of age, the order of importance of contributing factors was similar to that for younger drivers, except that Alcohol Involvement replaced Unsafe Speed as the second most frequently cited factor. On the other hand, for drivers over 50 years of age, Failure to Yield the Right of Way was the most frequently cited factor among those factors examined, followed by Driving WIthout Die Care, Waether, ALcohol Involvement, Following too Closely and Vehicle Fault, in that order.

Clearly, while all of the Contributing Factors examined are important in causing casualty accidents, they vary in frequency from age group to age group. Therefore, public education campaigns ought to take these variations ito consideration. For example, Unsafe Speed was noted more for the very young drivers than for older drivers, Alcohol Invlovement was noted more for young to middle-aged drivers, and Failure to Yield Right of Way was noted most often for drivers over 50 years of age. This is the sort of information that could be used to produce different educational materials "aimed" at each of these driver groups.

Towards Reducing Young Driver Traffic Accidents

This paper discusses the pros and cons to three approaches to reducing young driver traffic accidents: raising the drinking age, curfews for novice drivers, and raising the driving age. It concludes that the practical and political ramifications of these approaches need to be considered further before action is taken.

A Note on the Calculation of Traffic Accident Reduction and Raising the Drinking Age to 21 Years

This paper notes that a 20% reduction in alcohol-related casualty accidents among the 19-20 year old driver group would result in an overall reduction of between about 0.4% to 0.7% in casualty traffic accidents.

VICTIMS OF TRAFFIC ACCIDENTS

Traffic Casualty Types and Locations: Drinking Driver vs Sober Driver Accidents, British Columbia, 1982

In sum, while sober drivers cause about four times the number of casualties as do drinking drivers, the most frequent casualty for both sober driver and drinking driver accidents is the driver himself. However, the next most frequently noted source of casualties for sober driver accidents is persons in other vehicles, while for drinking driver accidents it is the drinking driver's passengers. Knowing this, it would seem reasonable to produce a public education campaign which emphasizes the danger of being a passenger with a drinking driver. In addition, resources should be directed toward understanding and reducing the 80% of accidents and casualties not associated with drinking driving.

Passengers in Casualty Traffic Accidents: Drinking Drivers vs Sober Drivers, British Columbia

The drinking driver in casualty traffic accidents, when compared to the sober driver in casualty traffic accidents, is more likely to be male, to be younger, to carry more passengers, to carry passengers more often, and to carry more male passengers. On the other hand, both the drinking driver and sober driver in these accidents tend to be, on the average, older than their passengers.

Turning to a comparison of male and female drinking drivers in casualty traffic accidents, the female drinking driver is more likely to be carrying passengers, to be carrying more passengers, and to be carrying more female passengers.

Finally, generally the younger the driver in these accidents, the more likely the driver will by carrying a greater number of passengers, although this relationship is stronger for male drinking drivers than for male sober drivers.

If one were to roughly characterize the drinking driving casualty traffic accident from these data, it would involve a young male carrying passengers, two out of three who are male, and all of whom are younger than he.

Pedestrian Casualty Traffic Accident Facts, British Columbia, 1983

- * In 1983 there were 1,977 pedestrian casualty accidents resulting in 2,092 casualties. 12% were hit-and-run.
- * Two thirds of these casualties were male, and adolescents and young adults made up the bulk of all pedestrian casualties.
- * Twenty-four percent of these casualty accidents were caused by pedestrian error, 33% occurred when the pedestrian was crossing with no crosswalk or signal, and about half occurred at intersections.
- * Slightly more occurred in Winter, fewer in Summer.
- * Fridays and Saturdays produced high numbers of pedestrian casualty accidents, as did all afternoons.
- * As one would expect, this is a municipal, as opposed to rural phenomenon. For example, while pedestrian casualty accidents comprised 8.6% of all casualty accidents provincially, they made up 16% of those in the Vancouver area and generally less than 5% in rural areas.
- * Probably because these accidents occur during times of the day when there are relatively few drinking drivers on the roads, relatively few involve a drinking driver.
- * Pedestrian casualty accidents will probably increase in relation to other sorts of accidents, and this in turn will probably necessitate a reassessment of police resources and priorities regarding same.

LOCATIONS AND CAUSES OF TRAFFIC ACCIDENTS

Casualty Traffic Accident Locations, British Columbia, 1983

The two types of locations that produce the largest numbers of casualty traffic accidents are at intersections (43%) and between intersections (42%). The former are more urban phenomena, and are most often caused by Failure to Yield The Right of Way, while the latter are more rural and are caused by Driving Without Due Care, Alcohol Involvement, and Speeding, in that order. Because intersection accidents occur at known locations and occur because of specific driving behaviours that are not linked to "lifestyle", they can probably be more easily reduced through law enforcement and public information efforts than can "between intersection" accidents, which occur at more locations and are caused by the "lifestyle" and somewhat socially accepted behaviours of drinking and driving above the speed limit.

Casualty Traffic Accidents in Vancouver City, Victoria, and North Vancouver, 1983

This paper finds that, like other urban centers, casualty traffic accidents in these areas can be characterized as primarily injury accidents involving other motor vehicles at intersections and are largely due to careless driving and failure to yield the right of way. However, Vancouver City appears to have a high proportion of pedestrian accidents.

Casualty Traffic Accident Causes by Police Reporting Area, British Columbia, 1983

This is a tabular presentation of some of the primary causes of casualty traffic accidents broken down by police reporting detachments.

DRINKING DRIVING ROADCHECK "BLITZES"

The Relationships Among Driving While Impaired Charges, Police Visibility, and Alcohol-Related Casualty Traffic Accidents, British Columbia, December 1977- December, 1982

A longitudinal examination of police visibility, alcohol-related casualty traffic accidents and Driving While Impaired (D.W.I.) charges found that: the frequency of D.W.I. charges related neither to a reduction of alcohol- related casualty traffic accidents nor to the frequency of police drinking- driving roadcheck activities as measured by vehicles checked by BATmobile teams. On the other hand, police visibility, as measured by BATmobile roadcheck activity, related significantly to a reduction of alcohol-related casualty traffic accidents in the month the checks were carried out and continued to be related to a reduction in these accidents in the following month. An explanation for these relationships is that the potential drinking driver's fear of apprehension is increased by the police presence and thus that driver does not drink and drive and consequently avoids alcohol-related accidents. Therefore, it is recommended that police resources should be directed toward high visibility roadcheck activities in order to reduce alcohol-related traffic casualties.

An Evaluation of the April-May 1984 Drinking Driving Roadcheck, Enforcement and Media "Blitz"

The April- May 1984 roadcheck, enforcement, and media drinking driving "blitz" co-ordinated by the Police Advisory Committee failed to reduce the number of alcohol-related casualty traffic accidents below levels that would have been expected had there been no blitz. The probable explanation for this is that, due to insufficient media coverage, possibly linked to a Lower Mainland area newspaper strike, the public was not aware of the blitz and therefore did not change their drinking driving behaviours.

RESTRAINT DEVICE USE STUDIES

Trends in Reported Restraint Device Use by Occupants in Injury/Death Traffic Accidents, British Columbia, January 1977- June 1983

Considering occupant restraint device use in casualty traffic accidents reported on the Traffic Accident Report Form (MV104) from January 1977 to June 1983 in British Columbia:

1. The 1977 restraint device legislation was very effective and immediately increased restraint device useby vehicle occupants in casualty accidents to about three and a half times the pre-legislation level.

2. By mid 1979 restraint device use had dropped to about three times the pre-legislation level, but has gradually increased since then to the immediate post-legisaltion level.

3. Reported restraint device use by occupants in casualty traffic accidents is highest in December-January and lowest in mid-summer, suggesting that the anti-drinking driving media and enforcement campaigns may have a more general effect on traffic safety practices, and that summer campaigns ought to be attempted.

Trends in Restraint Device Use by Young Occupants in Casualty Traffic Accidents, British Columbia, January 1980- September, 1984

The use of restraint devices in motor vehicles has increased substantially between 1980-1984, especially within the younger age groups, as reflected in occupant restraint device use as reported on Traffic Accident Report Forms (MV104) completed by attending police officers at casualty traffic accidents. To illustrate, between 1980-1984, reported restraint device use increased by 70% for the 0-5 year old group, 57% for the 6-12 year old group, 36% for the 13-17 year old group, and 28% overall. From the MV104 casualty accident reports, the use rates in 1980 vs 1984 for these age groups were as follows: 0 - 5 year old group - 44% vs 75%; 6 - 12 year old group - 47% vs 74%; 13 - 17 year old group - 59% vs 80%; and overall 64% vs 82%. Further, in all years and all age categories examined, use rates were highest in the Winter months and lowest in the Summer months. However, it must be noted that the overall rate of increase appears to be levelling off.

It can be reasonably argued that the increase in use rates that began in late 1981 and has continued to date can, in part, be attributed to increased restraint device use law enforcement and "blitzes", to intensive elementary school programs and to increased public education and awareness campaigns, all assisted by the Traffic Safety Education Department of I.C.B.C. As use rates appear lowest in the Summer, perhaps this would be a particularly appropriate time of year for future enforcement and education campaigns. Finally, as the use rates appear to be reaching a plateau, current enforcement and education efforts must be maintained or even increased.

Restraint Device Use and Ejection From Vehicle

Analyses of restraint device use in casualty traffic accidents in British Columbia for 1982 shows that in 40% of the cases one or more victims were not wearing a restraint device and in about 7% of the cases one or more victims were partially or completely ejected from the vehicle. Regionally, the Lower Mainland showed the fewest of these sorts of accidents, while the Prince George, Prince Rupert, Kelowna and Kamloops RCMP subdivision reporting areas showed the greatest number. The report recommends that enforcement and education resources be allocated to the areas where these accidents occur.

A Note on the Effectiveness of "80% Clicks"

The "80% Clicks" seat belt enforcement and education "blitz" proved effective in reducing casualties below the level that would have been expected without the campaign. The savings in insurance costs amounted to over $1 million within the month following the "blitz".

THE COUNTERATTACK PROGRAM

Counter Attack

Although many people may not be aware of it, Driving While Impaired is the single most serious and costly criminal activity in British Columbia. Consider the following — in an average year in B.C. about 110 people are murdered, but about 250 people are killed in drinking driving accidents. Further, while in an average year in B.C. there are about 450 woundings, yet about 7,200 people are injured in drinking driving accidents. The impact of this crime on the justice system is staggering: about 22,000 persons are charged under the Canadian Criminal Code every year in B.C. at a cost of at least 22 million dollars, and these charges comprise a third of the entire Criminal Code case burden before the courts.

CounterAttack is a crime prevention program aimed directly at reducing drinking driving and the accidents associated with it. Started in 1977, the program is co-funded by the Ministry of Attorney General and the Insurance Corporation of B.C., and has a combined budget of $600,000. Essentially, the crime prevention aspects of the program take three inter-related forms: visible enforcement, public education, and research and evaluation.

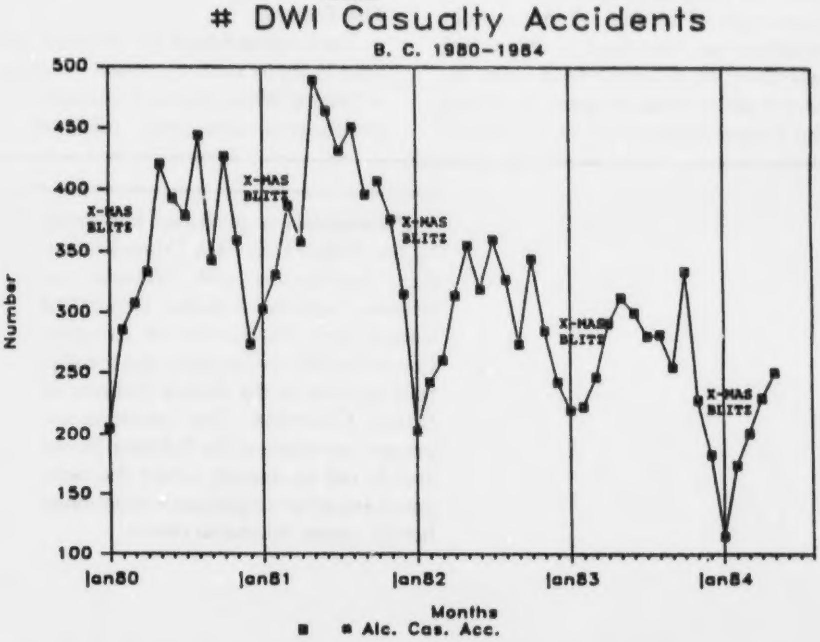
Visible Enforcement:

Research has shown that visible enforcement is a powerful tool in crime prevention. If people perceive a strong and immediate police presence, they are less likely to commit a crime. Using this principle, the CounterAttack program has assisted the police in their drinking driving "blitz" activities by supplying them with 14 mobile breath testing vans (BATmobiles), by producing media materials to help publicize these blitzes, and by helping the police to co-ordinate and evaluate the blitzes. As a direct result of these blitzes, the level of drinking driving accidents is at its lowest during the Christmas and New Year's period, as can be seen from Figure 1.

Public Information:

In addition to producing the well-know CounterAttack television messages, radio messages, brochures and posters, the CounterAttack Program, operated through I.C.B.C., supplies all of the schools in the province with drinking driving educational materials in the form of lesson plans, films, videotapes, slide presentations, and so on. Further, the program assists hundreds of adults and youths in organizing local CounterAttack groups and local anti-drinking driving initiatives and campaigns. The latest major event to encourage drinking driving crime prevention at a community level was the November 29–30 CounterAttack/I.C.B.C. Community Leaders Conference. This conference attracted well over 400 community leaders from throughout the province to hear world-class experts on traffic safety and to discuss ways and means of reducing drinking driving accidents.

FIGURE 1



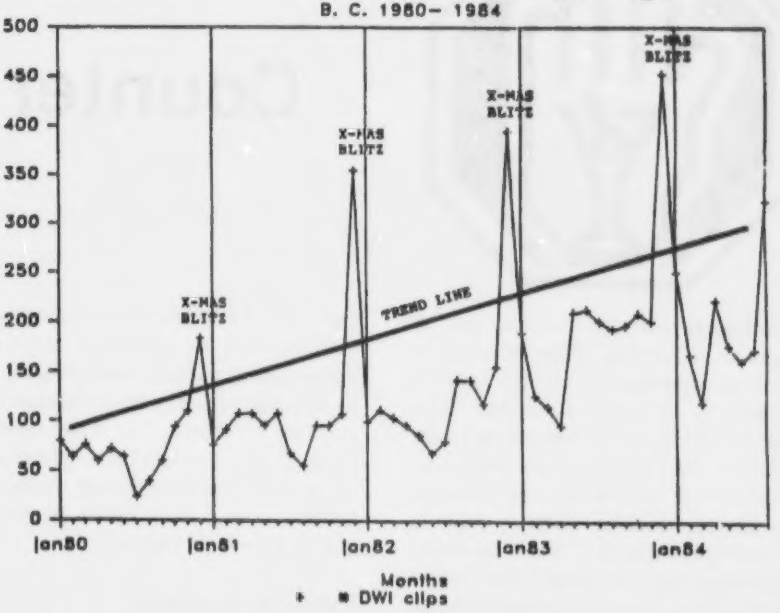
PREVENTION

One piece of evidence that these efforts are helping to make the public more aware of the seriousness of drinking driving is reflected in the steady increase in press coverage of the issue over the past few years, as shown in Figure 2.

FIGURE 2

# DWI Newspaper Clippings

B. C. 1980– 1984



Research and Evaluation

An absolutely essential component of any crime prevention program is the constant evaluation and improvement of that program through research. One example of CounterAttack's research aimed at improving public information stems from a B.C.-wide survey done by the program that found that people were not aware that the penalties for Driving While Impaired could be severe. Based on this, and using the notion that for a law to have a deterrent effect the penalties must be known, CounterAttack produced television and radio messages telling the public of these penalties. Research findings also directed the public information messages concerning the dangers of riding with a drinking driver and that 75% of the vicitims of drinking drivers are in the drinking drivers' vehicles.

Overall, the research suggests that since the program began in 1977, the proportion of alcohol-related casualty accidents has been kept to about 10% less than what would have been expected without the program. Each year this translates into a savings of about 30 lives, 850 injuries, and $10 million dollars which would otherwise be paid out in insurance, hospital, and justice systems costs. In short, this is a very good return on a $600,000 investment.

The Future:

The CounterAttack program will continue to try to work to prevent the crime of Driving While Impaired through community programs, public information, enforcement, and research. In the immediate future the program, in conjunction with I.C.B.C. and the Police Advisory Committee (P.A.C.), will support the 1985 Easter drinking driving blitz, and will be producing new posters and brochures early in 1985. Finally, it is a goal of this program to work more closely with crime prevention practitioners in order to combat B.C.'s most serious crime — drinking driving.

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THE MEASUREMENT OF "ALCOHOL INVOLVEMENT"

A Note on the Reliability and Validity of Police Reporting of Alcohol Involvement in Casualty Traffic Accidents on the British Columbia Motor Vehicle Department Traffic Accident Report Form (MV104)

Summary

Using American police and coroners' reports, J.C. Fell in Tracking the Alcohol Involvement Problem in U.S. Highway Crashes (27th Annual Proceedings, American Association for Automotive Medicine, 1983) notes that when the police designate a driver to have alcohol involvement, they are in error about 5% of the time. He also indicates that, using both coroner and police data in combination, nationally alcohol was involved in 55-58% of fatal accidents, 17% of injury only accidents, 8% of property damage only accidents, and 11% of all accidents. However, the problem of the role of alcohol and how it relates to these figures is still unanswered. The presence or absence of alcohol, except at very high BAC levels, does not necessarily guarantee it a role in the cause of the accident. It is clear from this discussion that the police, when judging the role of alcohol as a contributing factor to casualty traffic accidents, produce figures which are less than those which speak to the presence or absence of alcohol, and that their figures on causation show a greater difference for fatal accidents (which comprise about 2% of their accident investigation burden) than for injury only accidents (which comprise about 98% of their accident investigation burden).

While it is important to more precisely determine the magnitude of the difference between the police judgement of alcohol as a causative factor and the presence of alcohol-- and this can only be done through ongoing hospital and coroner studies-- two things can be suggested concerning alcohol as a significant contributing factor in casualty accidents as indicated on the Traffic Accident Report Form (MV104) completed by the attending police officers at these accidents. First, that the MV104 data can probably be taken as an accurate (i.e. reliable and valid) indicator of changes in the rate of alcohol involvement over time. And second, that the police data are probably a reasonabe indicator of both the role and presence of alcohol in injury only accidents, however can only be seen as a measure of causative the role, not absolute chemical presence or level, of alcohol in fatal traffic accidents.

Finally, while studies tend to show that the police, when asked, are around 90% accurate in their judgement of the presence or absence of alcohol, perhaps the only way to determine this level of accuracy for the B.C. police forces is to change the MV104 so that they are required not only to judge whether or not alcohol played a significant role in the accident under investigation, but also to judge its presence as well.

A Note on the Reliability and Validity of Police Reporting of Alcohol Involvement in Casualty Traffic Accidents on the British Columbia Motor Vehicle Department Traffic Accident Report Form (MV104).

Traffic Accident Report Forms (MV104) are completed by attending police officers at casualty traffic accidents in British Columbia. Analyses of these reports often form the basis for government policy decisions regarding traffic safety priorities, and therefore it is critical that there be a clear understanding of the extent and limits of their reliability and validity, especially with regard to the assessment of the role of alcohol in the casualty accident. Consequently, it is the purpose of this note to discuss these matters.

Definition of Terms- Reliability and Validity:

Before examining this subject, perhaps it would be useful to distinguish between reliability and validity: reliability refers to how consistently a thing measures, while validity refers to how closely that measurement coincides with the true value of what is measured. For example, suppose one had a thermometer that underestimated temperature to some unknown degree. If one used that thermometer to measure temperature from day to day, one could accurately determine the number of degrees change from day to day, yet would not be able to say what the actual temperature was. Because the same instrument was used in the same fashion form day to day, the resulting measures would be reliable, but the measure of temperature on any given day would not be valid, because of the error in the thermometer (i.e. underestimation). On the other hand, the degree of temperature change measured from day to day would be a valid measure.

Finally, if one could gain access to a thermometer that was known to give accurate (i.e. valid) temperature readings, then one could calibrate the inaccurate one to the accurate one and from then on use the inaccurate thermometer to get an accurate reading (eg. if the inaccurate one was constantly 4 degrees less than the actual temperature, then simply taking the inaccurate reading and adding 4 degrees would produce a valid reading. As is shown below, this analogy applies directly to the MV104 data.

MV104 Reliability:

It is reasonable to assume that alcohol as a contributing factor as indicated on the MV104 is a relaible measure, as these forms have been completed by the same sort of person (attending police officer) using the same instruction manual under the same conditions (casualty traffic accident) since 1977.

MV104 Validity in Measuring Change:

If one makes the reasonable assumption that the overall MV104 reporting of alcohol as a contributing factor to the accident is reliable, then it is also a valid measure of change over time. That is, a reported percent change from month to month and year to year can be seen as a more-or-less true reflection of change in the rates of alcohol involvement in casualty traffic accidents, even though the reported levels may not accurately reflect the true levels of alcohol involvement.

MV104 Validity in Measuring Alcohol Involvement:

How closely the MV104 reports of alcohol as a contributing factor to casualty traffic accidents reflect actual levels of alcohol involvement in these accidents is a difficult question, as it very much depends on both the definition of "alcohol involvement" used and whether or not one is referring to a fatal or injury only accident. In addition, there is a real problem in finding reliable and valid measures of alcohol involvement, however defined, with which to compare the MV104 reports.

Fatal Traffic Accidents: In B.C. fatal traffic accidents comprise about 2% of all police investigated casualty traffic accidents. One source of alcohol data comes from coroner's reports. However, there are a number of aspects of coroner's reports that make them difficult to compare to the MV104 assessment of alcohol as a significant contributing factor to these accidents. First, not all drivers killed have toxicologies done or reported. Certainly, it is more likely that a toxicology will be done on a driver who is dead on arrival to hospital or shortly thereafter, but these drivers tend to come from high-speed (and therefore more violent) accidents which in turn have been shown to be those accidents most likely to be alcohol-related. Second, a toxicology reports the presence or absence of alcohol at thus-and-such a level, while the police are reporting not presence or absence but rather whether or not alcohol was a significant contributing factor to the accident. Finally, it is arguably more difficult for an attending officer to assess the role and/or presence of alcohol from a dying or dead victim than it would be if the person were less severely injured.

For all of the above reasons, one would expect that the proportion of fatal traffic accidents where the investigating officers consider alcohol to be a causal (i.e. contributing) factor to be substantially less than the proportion of fatal accidents where the coroner reports alcohol to be present. In fact, in 1983 the B.C. coroner reported that 50% of the drivers killed showed toxicological evidence of having consumed alcohol, while the MV104 data indicated that alcohol was considered to be a significant contributing factor to about 36% of fatal accidents.

Finally, while B.C. data are not available, New Zealand figures show in fatal traffic accidents that their police are about 94% accurate in judging the presence of alcohol when it is present and 88% accurate in judging the absence of alcohol when it is absent.

Injury Only Traffic Accidents: Injury only casualty traffic accidents comprise about 98% of all casualty accidents in B.C. The only source of alcohol data (other than MV104) for these accidents comes from a CounterAttack study done in 1977-78 on injured persons entering the Royal Columbian Hospital. That study indicated that 26% of those drivers tested had a Blood Alcohol Content (BAC) of .08% or greater, and 14% had a BAC of .15% or greater, while the police estimated that alcohol was the primary single cause of the accident in 17% of the cases. Exactly how one reconciles these figures is open to question. However, New Zealand figures show that for injury only accidents police estimates of the presence of alcohol when it is present to be 90% accurate and police estimates of the absence of alcohol when it is absent to be 96% accurate.

An Overview:

Using American police and coroners' reports, J.C. Fell in Tracking the Alcohol Involvement Problem in U.S. Highway Crashes (27th Annual Proceedings, American Association for Automotive Medicine, 1983) notes that when the police designate a driver to have alcohol involvement, they are in error about 5% of the time. He also indicates that, using both coroner and police data in combination, nationally alcohol was involved in 55-58% of fatal accidents, 17% of injury only accidents, 8% of property damage only accidents, and 11% of all accidents. However, the problem of the role of alcohol and how it relates to these figures is still unanswered. The presence or absence of alcohol, except at very high BAC levels, does not necessarily guarantee it a role in the cause of the accident. It is clear from this discussion that the police, when judging the role of alcohol as a contributing factor to casualty traffic accidents, produce figures which are less than those which speak to the presence or absence of alcohol, and that their figures on causation show a greater difference for fatal accidents (which comprise about 2% of their accident investigation burden) than for injury only accidents (which comprise about 98% of their accident investigation burden).

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PUBLIC OPINIONS ON AND KNOWLEDGE OF DRINKING DRIVING

SUMMARY

The following is an overview of a British Columbia wide telephone survey of persons over 15 years of age, done in order to investigate their opinions and beliefs concerning drinking driving. The survey was designed by the CounterAttack Program and was carried out by MarkTrend, an independent research firm. The highlights are:

* The respondents realized that people are more likely to be in a traffic accident if they have been drinking than if they have not.

* The respondents underestimated the liklihood of being convicted if charged with Driving While Impaired (DWI).

* The CounterAttack "BATmobile" and "call the police" television messages were the most frequently mentioned anti-drinking driving messages.

* When asked to name groups or organizations associated with drinking driving, the most frequently mentioned group was Mothers Against Drunk Driving (MADD), followed by the Government, the Police, and, all tied, CounterAttack, ALcoholics Anonymous, and citizens groups.

* About a third of the respondents admitted to being a drinking driver or a passenger with one in the previous month, and 7% admitted to having at some time been charged with DWI.

* When asked what should be done in order to reduce drinking driving, the respondents suggested increased penalties, increased apprehension rates, and increased education, in that order. Generally, the penalties suggested involved licence suspension, jail terms, and fines, all in excess of currently used levels. However, there was a clear distinction made among different offence consequences. For example, the average fine suggested for a first offence was $849.00, for a second offence, $1,234.00, for causing an accident without injury, $1,121.00, and for causing an accident producing injury or death, $2,572.00.

* About 85% thought that drinking driving was a very serious or extremely serious problem.

* Over 90% could correctly estimate the number of drinks that it would take an average person to become legally impaired.

* About 70% had no idea of the penalties for a DWI first offence, and of the remainder, not one person could correctly name the penalties.

Between February 6 and 10, 1984, Marktrend Inc. conducted a survey of the British Columbia population on behalf of the CounterAttack Program, Ministry of Attorney General. Six hundred and eight individuals were interviewed, two-thirds living in the Greater Vancouver Regional District, and one-third from all other parts of the province. The dataset is weighted, both by region of residence and by age, to conform to census parameters. The weighted frequency is 609. The sample as it is reported here, is representative of the entire population of British Columbia. (See also Part 5 of this report on Methodology.)

The questionnaire contained six general sections.

I Estimates of the Likelihood of Apprehension, Indictment, Conviction and Accident Occurrence when Driving Under the Influence
II Advertising Awareness
III Experience with driving and drinking driving
IV Proposed Punishments
V Views and Knowledge of Drinking Driving
VI Demographics

I ESTIMATES OF THE LIKELIHOOD OF APPREHENSION, INDICTMENT, CONVICTION AND ACCIDENT OCCURRENCE WHEN DRIVING UNDER THE INFLUENCE

One of the core areas of the survey contained a set of questions which asked the respondent to estimate, on a scale from 0 to 10, the likelihood of five events. All were prefaced with a scenario: a 150 pound person has three or four drinks in the space of one hour, and then drives home. The drive takes 20 minutes, uses both main and residential streets, and occurs at 10:00 pm on a Saturday night. Table 1 gives the average likelihood reported by our 609 respondents, for the five events described, as well as the percentage of the total who said "don't know" in response to each question.

Table 1 The Perceived Likelihood of Five Events

	Average	Don't Know %
The likelihood of being pulled over by the police for drinking driving	3.8	3.2
The likelihood of being charged with drinking driving, if the person were pulled over	6.4	5.8
The likelihood of being convicted of drinking driving if the person were charged	6.5	8.6
The likelihood of this person being involved in an accident	5.6	7.2
The likelihood of a person being involved in an accident who has not been drinking	1.5	6.6

The first conclusion to be drawn from these data is that the public's perceptions of these events do not conform to the facts. For example, the likelihood of being convicted if charged is somewhere between nine and ten, while the likelihood of being involved in an accident is somewhere between 0 and 1.

However, some accurate knowledge does exist in the public's mind. The people clearly understand that it is more dangerous to drive when drunk than it is when sober. They also understand that a drinking driver is much more likely to be charged with drinking driving if caught, than he or she is to be caught in the first place.

The utility of these figures does not come from their absolute values so much as it comes from the relationships they have with other characteristics. In later reports of this survey, we will discover who sees drinking driving to be least risky, particularly with respect to the penetration of advertising on the subject. And in later surveys, we will be able to compare these likelihood estimates with those that are reported before and after major drinking driving media campaigns.

II ADVERTISING AWARENESS

Several questions were asked to measure the respondents' awareness of advertising that has been conducted on the subject of drinking driving. These questions asked about exposure during the previous month, and were thus intended to avoid the New Year's blitz, although an undetermined number of respondents undoubtedly reported advertising that they had seen or heard during that period.

The first set of questions asked whether the respondent could recall hearing or seeing any messages having to do with drinking driving. If the answer was "yes", the next question asked the medium that carried the message. These results are presented in Table 2, where as many as three answers are recorded.

Table 2 Recall of Messages regarding Drinking Driving

Within the past month, do you recall having seen or heard any advertising messages having to do with drinking driving?

Where did you see or hear these messages?

Saw No Messages or Don't Know: 20%

Medium	First Message %	Second Message %	Third Message %
Newspaper	4	16	38
Billboard	2	11	15
Radio	18	36	10
Television	73	32	13
Bus stop sign	0	1	2
Magazines and brochures	1	2	13
Other	2	2	9
	100	100	100
Number of cases	(490)	(204)	(39)

Proportion recalling:	
One message	80%
Two messages	33%
Three messages	6%

Table 2 is divided into three parts. The first reports that one-fifth of the sample recalled seeing no drinking driving messages at all (16 percent) or were not sure (4 percent). Considering the usual tendency of respondents to want to appear informed, this is probably a conservative estimate of non-exposure to this type of publicity. It suggests that these advertising messages are not reaching large portions of the B.C. population, or that some people are not finding their content to be very memorable.

The second part of the table reports the medium which carried the remembered advertising. The obvious result is the importance of television, the medium that was cited first by nearly three-quarters of those who could remember a message.

An interesting progression occurs if we look at the better-informed segments of the sample. Among those who could cite two messages and their sources, radio emerges as an important source of information. Finally, looking at that small number of people who could remember three messages, the newspaper gets its due.

These figures should be understood in the context of those appearing in the third part of the Table, however. While 80 percent of the sample recalled one message, only 33 percent recalled two, and only 6 percent remembered three. We should therefore avoid the temptation to conclude that current levels of newspaper advertising will be likely to have an important influence on public opinion. Only if the level of use of this medium is increased could one expect such results.

Table 3 describes the major elements of message content that was recalled by our sample of British Columbians.

Table 3 Recalled Content of Drinking Driving Messages

What do you recall most from the message you (saw/heard)?

First Message	Percent Mentioning	Second Message	Percent Mentioning
Breathalyzer	24	Penalties for drinking driving	10
Phone the Police	19	Drinking and driving (radio ad)	8
Don't drink and drive	13	Breathalyzer	7
Drinking and drive (radio ad)	6	Unspecified radio ad	7
Penalties for drinking and driving	4	Don't drink and drive	7
News story (unspecified)	4	Labatt's for him, for her	7
Labatt's for him, for her	3	Don't drink and drive (newspaper ad)	5
Plus 42 other cites with fewer than 2% in each.		Phone the police	5
		News story (unspecified)	4
		News story (newspaper)	4
		Plus 28 other cites with fewer than 4% each.	
Percent responding "don't know"	39	Percent responding "don't know"	63

Third Message	Percent Mentioning
Don't drink and drive (billboard)	10
Don't drink and drive (newspaper)	8
Plus 21 other responses with 5 percent or fewer in each	
Percent responding don't know	77

These data suggest rather strongly the diverse perceptions people have of advertising regarding drinking driving. Two television commercials have a recognized identity: the one involving the man being handcuffed after taking a breathalyzer test in a CounterAttack van, and the other featuring a man and his son discussing a drinking driver and then stopping to call the police. Beyond this, few patterns exist.

The impression that the public perception of drinking driving advertising is murky at best is reinforced by the large numbers of people who remember seeing a message but cannot remember its content. Taking into account that only a fraction remembered seeing any message, as well as the "don't know" responses to the question on content, we arrive at the following proportions of the sample who could recall both seeing or hearing a message, and its content.

First message:	49 percent
Second message:	12 percent
Third message:	1 percent

Additional advertising on this subject should be able to increase these figures.

The final question in this series asked the respondents to mention any groups they could, which were conducting campaigns against drinking driving. Table 4 displays the results.

Table 4 Organizations Campaigning Against Drinking Driving

Can you name any groups or organizations that have been campaigning against drinking driving?

	Percent Mentioning
Citizens' Groups	
Mothers Against Drunk Driving	36
Alcoholics Anonymous	5
Citizens' Groups	5
The Government	
The Government	10
The Police	8
Operation Counter Attack	5
ICBC	1
Ministry of Transportation	.5
Liquor Distribution Branch	.2
Other	
Broadcaster's Association	3
Labatts	1
Liquor companies	1
BCAA	.6
Don't know	15
None	7

Clearly, the most visible advocate in this area is MADD, with 36 percent of the sample mentioning them. In one form or another, the government was mentioned by about one-quarter of the sample. Fifteen percent of the respondents did not know of any groups, and seven percent said no group was opposing drinking driving.

III EXPERIENCE WITH DRIVING AND WITH DRINKING DRIVING

One of the major dependent variables in this study is whether or not an individual had actually driven while under the influence of alcohol. This question was asked directly, but since it was feared that responses to such a question might not be candid, two other questions were also asked to supplement the measure. The three appear in Table 5.

Table 5 Measures of Driving Under the Influence

Did you drive last Friday after 9 o'clock?
Did you drive last Saturday after 9 o'clock?

Did not drive either evening	64
Drove one evening	27
Drove both evenings	9
	100%
	(602)

Within the past month, about how many times have you either driven after drinking, or been a passenger in a vehicle in which the driver had been drinking? By drinking I mean having more than two drinks.

Zero	71%
One	11
Two-Four	14
Five or More	4
	100%
	(603)

Have you ever been charged with driving while impaired?

Yes	7%
No	93
	100%
	(608)

These figures suggest that roughly one third of the driving public admits to some sort of relatively frequent contact with the phenomenon of drinking driving. Forty-six percent say they drove the previous week-end after 9 PM, a behavior which correlates quite regularly with drinking driving. Another 29 percent report either driving while under the influence, or riding with someone who was. Finally, seven percent admit that they have been charged with drinking driving.

These measures are used in other reports in this study to locate the incidences of drinking driving: in demographic terms; to measure the impact of advertising on this behavior; and to examine the relationships between this behavior and the perceived likelihood of being apprehended, charged, convicted, or involved in an accident.

Another sort of experience involves either seeing or being stopped at a police road block or spot check. These two questions were posed to our respondents, and their answers appear in Table 6.

Table 6 **Experience with Road Blocks or Spot Checks**

Within the past month, have you seen a police drinking driver road block or spot check?

Yes	17%
No	83
	100%
	(606)

Within the past month, have you been stopped at such a road block or spot check?

Yes	33%
No	67
	100%
	(105)

Table 6 makes clear that about one respondent in six has encountered a drinking driver road block or spot check within the previous month. Of these, one-third (about 5 1/2 percent of the total sample) were actually stopped. Working this the other way, we can estimate that a road block or spot check is seen by about three times the number of people who are stopped.

IV PROPOSED PUNISHMENTS FOR DRINKING DRIVING

Five questions in the survey investigated the topic of what the government's response should be to drinking driving. The first of these simply asked each respondent what should be done to reduce drinking driving.

Table 7 Proposed Measures to Reduce Drinking Driving

What do you believe should be done in order to reduce drinking driving?

	Percent
Have harsher penalties	29
Licence suspension	24
Educational programs to change attitudes	16
More roadblocks and spot checks	15
Stricter enforcement of existing laws	12
Higher fines	12
Longer prison sentences	9
More advertising	9
Restrict the availability of liquor	7

Plus 13 other cites containing fewer than 5 percent each

The responses given to this question can be collapsed into four main categories, as follows:

Increase punishments for drinking driving	75%
Increase likelihood of apprehension or conviction	34%
Educate the public	25%
Reduce the amount of drinking driving, *e.g.*: Restrict availability of liquor Raise the drinking age Improve public transportation	23%

Clearly, the major orientation of the public on this issue is a simple one: if you're caught, it's going to hurt. This view was taken by three-quarters of the sample. A third of the respondents thought raising the likelihood of getting caught was the best way to confront the problem of drinking driving. About one-quarter proposed educational measures, and an additional quarter suggested a variety of solutions all of which arrived at reducing drinking driving by getting drinking drivers off the streets. These figures add to more than 100 percent because respondents could give more than one answer. Consequently, categories may overlap. We note in passing that vehicle impoundment was not mentioned at all by the members of our sample.

The second part of this section gave the respondent four scenarios. All involve a drinking driver who is:

a) convicted of a first offense of drinking driving;

b) convicted of a second offense;

c) involved in an accident where no one was hurt; and

d) Involved in an accident in which someone was seriously injured or killed.

For each scenario, the respondent was asked to recommend the penalty. These results are abstracted in Table 8.

Table 8 Suggested Penalties for Four Different Incidents

	First Offense	Second Offense	Accident Without Injury	Accident With Injury or Death
License suspension	66	68	65	48
Jail term	11	24	17	32
Conviction for murder/ manslaughter	0	0	0	23
Fine	36	33	24	10
Liability for damages	0	0	8	8
Depends on the circumstance	8	9	6	6

No other response received more than 5 percent endorsement. Impoundment of the offender's vehicle was suggested by about one-half of one percent of the sample in each of the four cases.

These figures suggest a profile of opinion that is reasonably consistent. Licence suspension is the most frequently-suggested penalty, put forward in about two-thirds of the cases except in the most serious one, where respondents apparently felt that much stronger medicine was in order. Fines decrease in the frequency of mention as the severity of the incident increases. This penalty is clearly seen as more appropriate for simple drinking driver convictions. Finally, jail terms are not frequently recommended for first offenders, but are sanctioned by 55 percent of the sample in the case of an injury or death-causing accident.

The data in Table 8 are supplemented with information about the recommended length of licence suspension, and jail terms and amounts of fines. These figures have been averaged, and are presented in Table 9.

Table 9 **Recommended Magnitude of Punishments**

	First Offense	Second Offense	Accident Without Injury	Accident With Injury or Death
Suspension				
Average length in months	6.0	17.8	9.5	43.3
Percent saying "life"	2%	10%	6%	26%
Jail Term				
Average length in months	2.3	7.4	6.9	43.6
Percent saying "life"	0%	0%	0%	2%
Fines				
Avrage fine in dollars	$849	$1234	$1121	$2752
Percent saying "over $10,000"	0%	-	-	1%

In Table 9 we have a fairly orderly set of numbers. They indicate for example, that the public views a second offense as more serious than an accident without injury. This finding matches the data presented in Table 8, as well.

V. VIEWS OF AND KNOWLEDGE ABOUT DRINKING DRIVING

Three questions gave an overview of the sample's feelings about and knowledge of drinking driving. Table 10 presents the questions and results.

Table 10 Views of and knowledge about drinking driving

How serious is the problem caused by drinking drivers?

	Percent
Extremely serious	48
Very serious	37
Somewhat serious	14
Not very serious	-
Not at all serious	-
Don't know	1
	100
Number of cases	(609)

About how many drinks over the space of one hour do you think the average man would have to consume to be charged with drinking driving if he were stopped by the police? By a drink, I mean a beer, a glass of wine, or a one-shot liquor drink.

Average = 3.2

Percent saying less than two	4
Percent saying 2 or 2 1/2	29
Percent saying more than 4	13
Percent saying don't know	9

Table 10 (cont'd)

Do you happen to know the penalty for a first offense for drinking drining in British Columbia:

	Percent	
Licence suspension		33
24 hours (overnight)	2	
2 weeks to 1 month	1	
1 to 3 months	9	
3 to 6 months	17	
6 months and over	-	
duration unknown	4	
Fines		30
$50 or less	1	
$51 to $100	-	
$101 to $200	2	
$201 to $500	15	
$501 to $1,000	3	
Over to $1,000	2	
Amount unknown	7	
Jail sentence		7
24 hours (overnight)	3	
2 days to 1 week	1	
1 month or more	1	
Term unknown	2	
Other	5	
Don't know	69	

The first part of this table shows a result that was entirely expected: drinking driving is perceived to be a serious problem. There is variability in this measure, however, and other parts of this report examine the differences that may exist between those who see the problem as "somewhat serious" and those who think it is "very" or "extremely serious".

The second and third parts of this table test two bits of factual knowledge about drinking driving. The first test is passed with high marks. Over ninety percent of the sample could estimate the number of drinks it takes to cause legal impairment, and the average estimate is quite accurate (3.2 drinks). Still, the 9 percent who do not know, coupled with the 13 percent who think the limit is not reached with four drinks in an hour (those who answered more than 4 to the question) constitute a good fifth of the sample who are either uninformed or dangerously misinformed.

Knowledge about the sentence for a first offense of drinking driving was anything but consensual. One third mentioned licence suspension but only half of these agreed that the duration would be from 3 to 6 months. Similarly, 30 percent mentioned fines, but again, only one-half of these mentioned the $201 to $500 range. The most striking figure in this part of the table is the 69 percent who say they do not know the penalty. (The percentages do not add to 100 because respondents could give more than one answer).

VI DEMOGRAPHICS

The following demographic data were collected in this survey.

Geographic Region The data were weighted to represent each of the province's five regions. The results are as follows:

GVRD/Fraser Valley	51%
Vancouver Island/Coast	19
Kootenays	6
Okanagan/Interior	8
Kamloops/North	16
	100%
	(609)

Age Age is also a weighting criterion for this dataset. The weighted frequencies were:

16 - 24	21%
25 - 34	24
35 - 44	16
45 - 54	13
55 - 64	12
65 +	14
	100%
	(602)

Town or City of Residence The name of the locality in which the respondent lives is coded into the dataset. The list of these codes is available in the computer printout of variable frequencies.

Sex Sex was imposed as a quota used in the field phase of the study. The distribution in the data is:

Men	50%
Women	50
	100%
	(609)

DRIVER AGE AND CASUALTY TRAFFIC ACCIDENTS

The Relationship between Drivers' Age and Seven Commonly Cited
Contributing Factors to Casualty Traffic Accidents
British Columbia, 1982

Towards Reducing Young Driver Traffic Accidents

A Note on the Calculation of Traffic Accident Reduction
and Raising the Drinking age to 21 Years

The Relationship between Drivers' Age and Seven Commonly Cited Contributing Factors to Casualty Traffic Accidents
British Columbia, 1982

SUMMARY

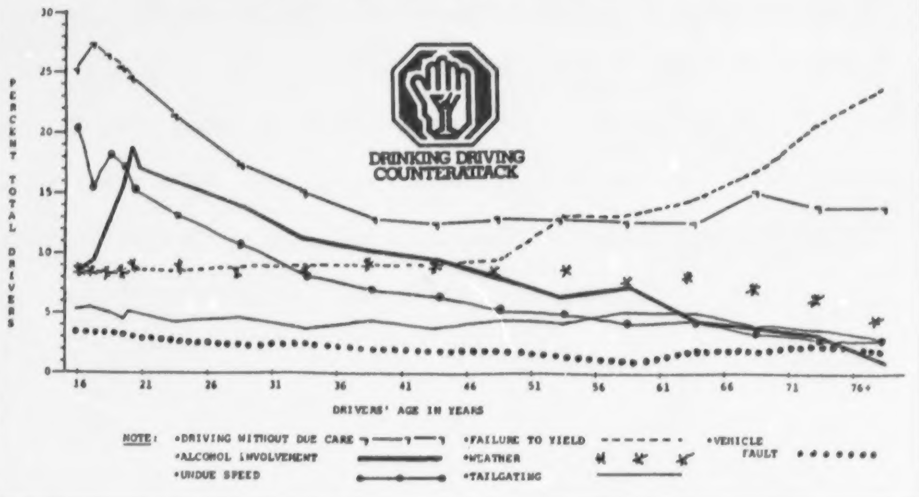


FIGURE 1
Contributing Factors to Casualty Accidents by Drivers' Age.

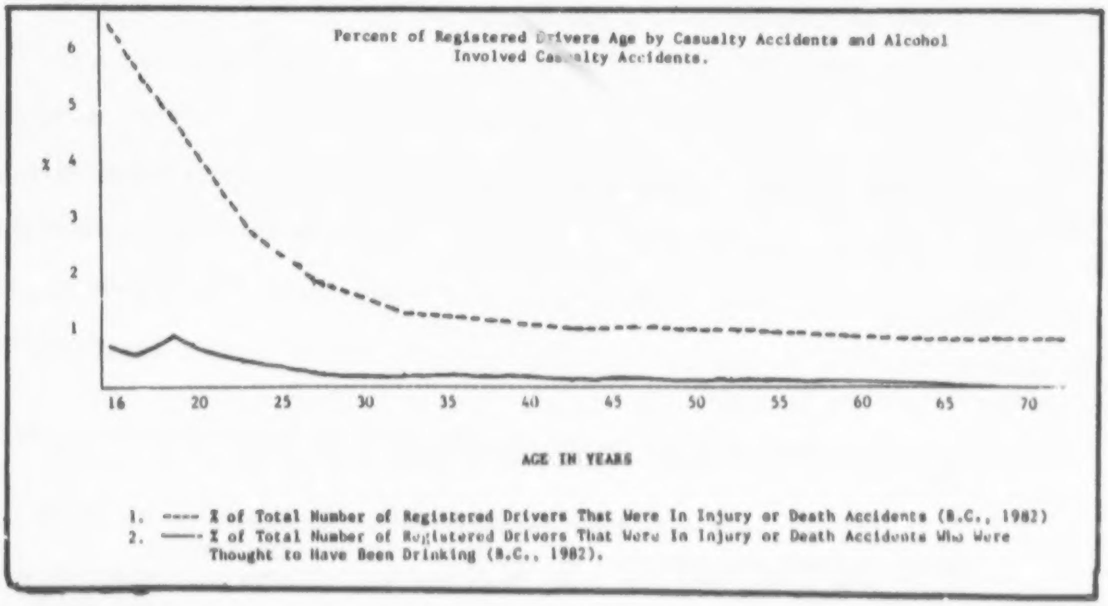
From the above it is clear that the contributing factors to casualty traffic accidents under consideration varied substantially from driver age group to driver age group: Specifically, Driving Without Due Care, Unsafe Speed, Alcohol Involvement and Vehicle Fault were more frequently cited for younger drivers than for older drivers. For drivers between 26-50 years of age, the order of importance of contributing factors was similar to that for younger drivers, except that Alcohol Involvement replaced Unsafe Speed as the second most frequently cited factor. On the other hand, for drivers over 50 years of age, Failure to Yield Right of Way was the most frequently cited factor among those factors examined, followed by Driving Without Due Care, Weather, Alcohol Involvement, Following too Closely and Vehicle Fault, in that order.

Clearly, while all of the Contributing Factors examined are important in causing casualty accidents, they vary in frequency from age group to age group. Therefore, public education campaigns ought to take these variations into consideration. For example, Unsafe Speed was noted more for the very young drivers than for older drivers, Alcohol Involvement was noted more for the young to middle-aged drivers, and Failure to Yield Right of Way noted most often for drivers over 50 years of age. This is the sort of information that could be used to produce different educational materials "aimed" at each of these driver age groups.

THE RELATIONSHIP BETWEEN DRIVERS' AGE AND SEVEN COMMONLY CITED CONTRIBUTING FACTORS TO CASUALTY TRAFFIC ACCIDENTS

BRITISH COLUMBIA, 1982

Among those concerned with traffic safety issues, it is generally recognized that young drivers comprise a high proportion of persons in casualty traffic accidents, and that drinking driving contributes substantially to their representation in this group. For example, from line 1 on the figure below[1] it can be seen that a higher percent of younger registered drivers were in traffic accidents causing injury and/or death than was the proportion of older registered drivers in same. Further, from line 2 it can be seen that the proportion of younger registered drivers who were thought to have been drinking and who were in casualty accidents is greater than the proportion of older drinking drivers in these sorts of accidents.



Percent of Registered Drivers Age by Casualty Accidents and Alcohol Involved Casualty Accidents.

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[1] Taken from CounterAttack Brief Report #10, Ministry of Attorney General, August, 1983.

However, what is also evident from the figure is that drinking drivers at all age levels comprise a relatively small proportion of the drivers in casualty accidents. Consequently, it is the purpose of this report to examine the contribution of a variety of factors to casualty traffic accidents in terms of the age of drivers.

More specifically, this paper examines, for each driver in casualty accidents in British Columbia in 1982, the contribution of the following frequently cited[2] factors: Driving Without Due Care; Alcohol Involvement; Unsafe Speed; Failure to Yield Right of Way; Weather; Following too Closely (tailgating); and Vehicle Fault. The category Vehicle Fault is a catch-all for all of the more detailed vehicle-fault factors such as defective steering, defective brakes, defective tires and so on. It was specifically included because of the suggestion by D.R. Mayhew in Age, Alcohol and Fatal Crash Risk (Ottawa: Traffic Injury Research Foundation, 1982) that younger drivers may be frequently involved in crashes caused by faulty vehicles.

METHOD

Accident reports are compiled and put into a computer-readable form by the Ministry of Transportation and Highways, and from this, a wide variety of analyses can be done.[3] The subset of accidents that this report deals with is that set of accidents involving injury and/or death (i.e. casualty accidents). The reason for limiting the sample to this group is twofold: First, it would be very costly in terms of computer time to deal with all reported accidents - for example, in B.C. in 1982 there were 118,147 reported accidents, but only 24,220 accidents (20.5%) involved injury or death. Second, many accidents not involving injury or death are reported by drivers to the police some time after the accident, whereas those involving injury or death are usually attended by police who also fill out the Accident Report Forms (MV104). Therefore, the data from reports completed by the police are likely to be the most valid and reliable.

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[2] See CounterAttack Brief Report #4, Ministry of Attorney General, May, 1983.

[3] It should be noted here that information on accidents is constantly being revised and improved by the Motor Vehicle Department. It follows that the figures drawn from one set of data may differ from figures drawn from an updated set, and therefore any figures produced by the M.V.D. after the creation of this data set (August, 1983) which contradict these figures should be considered correct.

Finally, while some research on traffic accidents is limited to only those accidents resulting in deaths, this research is based on accidents involving injury and/or death. The reason for this is that very often the difference between a accident involving injury and one involving death is, in terms of the physics of the accident, minimal - a matter of a few kilometers an hour difference in speed or a few centimeters difference in the location of the impact. Therefore, by combining injury-related and death-related accidents into one group, the research can be based on a sample of accidents at least forty times greater than the number of death-related accidents and thus one can have considerably more confidence in the reliability of the results of the research.

Analyses:

The Traffic Accident Report Form (MV104) completed by the attending officer at casualty accidents allows up to three Contributing Factor codes to be associated with each driver in the accident. In order to determine the factors associated with each driver, all three Contributing Factor codes for each driver were scanned, and if, for example, Failure to Yield

Right of Way was found for the driver to be in either the first, second, or third Contributing Factors code, then the driver would be counted in the "Failure to Yield Right of Way" group of drivers. That is, if the factor of interest was cited at all for a driver, the driver was associated with that factor. It must be noted that this means that there can be double and even triple counting for any one driver, depending on how many factors were cited. To illustrate, assume one two-vehicle casualty accident and one single-vehicle casualty accident as follows:

THE ACCIDENTS

Accident	Driver #1 Factors	Driver #2 Factors
Accident 1 (2-vehicle)	1. Alcohol Involvement 2. Unsafe Speed 3. NONE NOTED	1. Failure to Yield Right of Way 2. Alcohol Involvement 3. NONE NOTED
Accident 2 (1-vehicle)	1. Alcohol Involvement 2. Unsafe Speed 3. Brake Failure	NO DRIVER

Depending on the unit of analysis used (i.e. The Accident vs The Driver vs The Factors) the apparent contributions of the Factors will vary substantially as noted below.[4]

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[4] As an aside, if one were to examine these two accidents in terms of Driver #1, Factor #1 only, all one could say is that 100% of the accidents involved alcohol. Clearly, this approach is misleading and therefore is not used in this report.

UNIT OF ANALYSES		
The Accidents (N=2)	The Drivers (N=3)	The Factors (N=7)
100% of the accidents were associated with alcohol (i.e. both of them).	100% of the drivers had been drinking (i.e. all three).	42% of the factors cited were Alcohol Involvement (i.e. three of seven).
100% of the accidents were associated with speeding (i.e. both of them).	67% of the drivers were speeding (i.e. two of three).	28% of the factors cited were Unsafe Speed (i.e. two of seven).
50% of the accidents were associated with failure to yield (i.e. one of two).	33% of the drivers failed to yield (i.e. one of three).	14% of the factors cited were Failure to Yield Right of Way (i.e. one of seven).
50% of the accidents were associated with a vehicle fault (i.e. one of the two had Brake Failure).	33% of the drivers had a faulty vehicle (i.e. one of the three had the brakes fail).	14% of the factors cited were Brake Failure, which is a Vehicle Fault Condition (i.e. one of the seven).

In this report, the data were examined using the driver as the unit of analysis, and the Contributing Factor proportions were calculated as in the above example.

In detail, as noted above, the MV104 report on each driver in casualty accidents in B.C. in 1982 was examined in order to determine the drivers' age at the time of the accident (birth date and date of accident were used for this calculation) and whether or not the following Contributing Factor codes were cited for each driver as either first, second, or third Contributing Factors: Driving Without Due Care: Alcohol Involvement; Unsafe Speed; Failure to Yield Right of Way; Weather; Following too Closely (tailgating); and factors that were considered to be a Vehicle Fault. Drivers were then categorized in terms of their age for each of these factors and the proportion of drivers associated with each Contributing Factor was calculated within each age category.

Finally, it is self-evident that only instances where drivers birth date, date of accident, and Contributing Factors were all indicated could they be included in these analyses.

RESULTS

As can be seen from Table 1 and from Figure 1, the majority of Contributing Factors examined varied with the age of the drivers. The following describes each factor separately.[5]

Driving Without Due Care:

Provincially, about 18% of the drivers in casualty accidents in B.C. in 1932 were, in the opinion of the attending officer, driving without due care and that this lack of care contributed to the accident occurring. This factor was cited for higher proportions of young drivers than older drivers, with the highest proportion in the 16-20 year old driver range at about 25-26% and the lowest proportion in the 36-65 year old driver range at about 13%. Further, while this factor generally was cited less often for older drivers, its frequency of citation increased somewhat after age 66 to about 14%. Generally, those drivers younger than 26 had Driving Without Due Care cited more often than the provincial average, while those older than 25 had it cited less often than the provincial average.

Alcohol Involvement:

Provincially, about 12% of the drivers in casualty accidnets in B.C.

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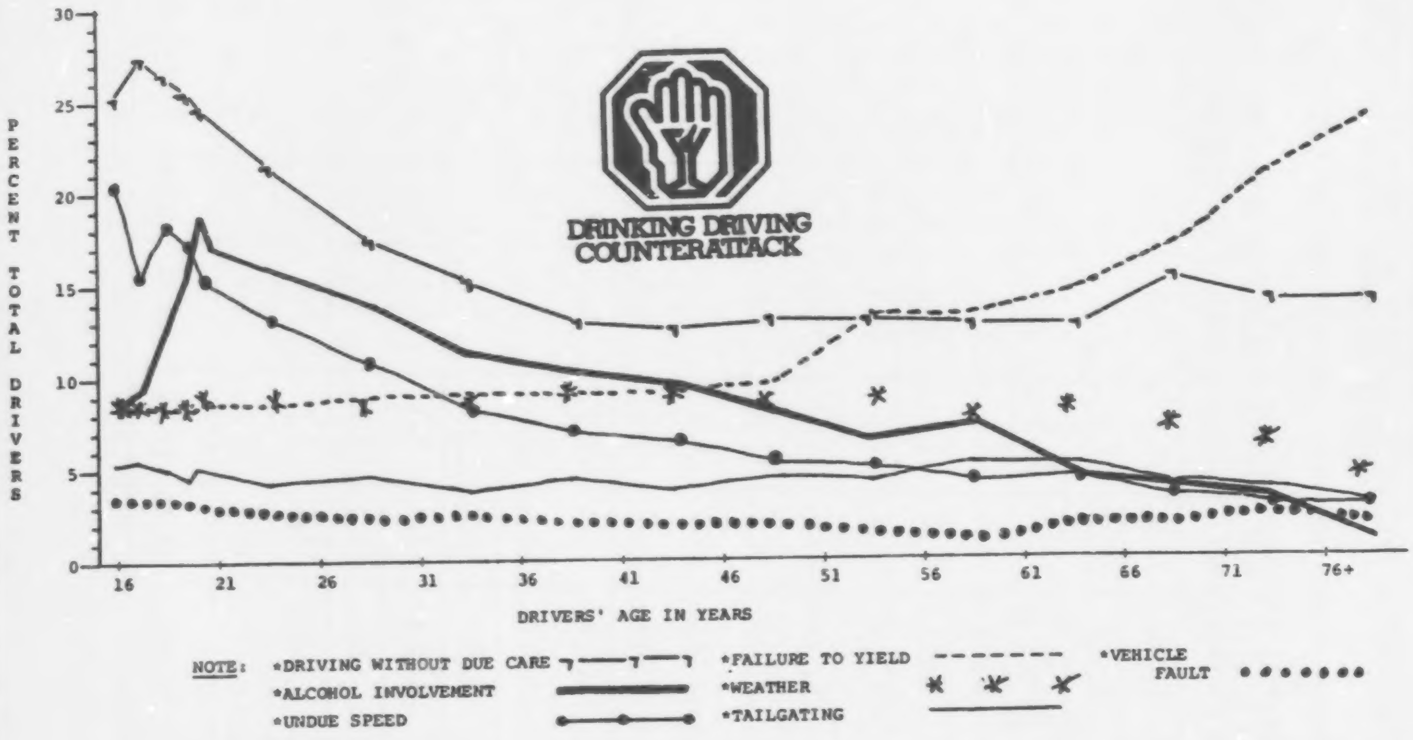
[5] Some numbers differ from earlier publications due to data update.

TABLE 1
CONTRIBUTING FACTORS TO CASUALTY ACCIDENTS BY DRIVERS' AGE
BRITISH COLUMBIA, 1982

DRIVER AGE	TOTAL # DRIVERS IN CASUALTY ACCIDENTS	% W/O DUE CARE	% ALCOHOL INVOLV.	% UNSAFE SPEED	% NOT YIELD	% WEATHER	% TAIL-GATE	% VEHICLE FAULT
16	1,004	25.3	8.9	20.6	8.9	9.2	5.3	3.6
17	1,518	27.5	9.5	15.7	9.0	8.9	5.7	3.4
18	1,784	26.3	15.6	18.6	8.5	8.5	5.1	3.4
19	2,001	25.4	18.9	17.1	8.5	7.6	4.8	3.4
20	1,833	24.6	17.1	15.1	8.7	9.1	5.1	3.2
21-25	7,224	21.4	16.5	13.4	8.8	8.5	4.2	2.8
26-30	5,131	17.5	14.1	10.9	9.2	8.6	4.8	2.3
31-35	4,206	15.2	11.6	8.4	9.1	8.5	3.8	2.6
36-40	2,842	13.1	10.5	7.2	9.3	9.6	4.7	2.2
41-45	2,024	12.8	9.8	6.4	9.1	9.0	4.1	2.2
46-50	1,620	13.4	8.3	5.7	9.8	8.3	4.6	2.2
51-55	1,527	13.4	6.6	5.1	13.6	8.7	4.1	1.6
56-60	1,353	12.9	7.2	4.4	13.7	7.4	4.8	1.0
61-65	1,004	12.9	4.8	4.4	14.8	8.5	4.9	2.0
66-70	779	15.3	4.0	3.6	17.1	7.2	3.6	1.8
71-75	531	14.3	3.4	2.4	20.7	6.2	3.2	2.2
76+	428	13.8	1.6	2.8	23.4	4.2	3.7	1.0
PROV. TOTAL	36,867	18.4%	12.3%	10.7%	10.0%	8.5%	4.5%	2.5%

FIGURE 1

Contributing Factors to Casualty Accidents by Drivers' Age.



had, in the opinion of the attending officer, been drinking and that this drinking contributed to the accident occurring. Young drivers were cited for this factor more often than were older drivers: from a citation frequency of about 9% for the 16-year old driver group, it rose abruptly to about 19% for the 19-year old group, and then gradually declined to a low of about 2% for the 76+ year old group. Generally speaking, those drivers young than 31 had the factor of Alcohol Involvement cited more often than the provincial average, while those older than 30 had it cited less often than the provincial group.

Unsafe Speed:

Provincially, about 11% of the drivers in casualty accidents in B.C. in 1982 were, in the opinion of the attending officer, driving at an unsafe speed, and that this speeding contributed to the accident occurring. As with Driving Without Due Care and Alcohol Involvement, Unsafe Speed was cited more frequently for younger than for older drivers: from a high of about 21% for 16-year drivers, the citation frequency of Unsafe Speed dropped to about 15% for 20-year old drivers, and then declined gradually to a low of about 3-4% for those drivers over 55 years of age. Generally, Unsafe Speed was cited more often than average for drivers younger than 31 and less often than average for drivers older than 30.

Failure to Yield Right of Way:

Provincially about 10% of the drivers in casualty accidents in B.C. in 1982, in the opinion of the attending officer, failed to yield the right of way, and this failure contributed to the accident occurring. However, unlike Driving Without Due Care, Alcohol Involvement and Unsafe Speed, Failure to Yield Right of Way is cited much more often for older than for younger drivers: this factor was cited at about 9% for drivers between the ages of 16-45 years of age, and then rose quickly to a citation level of about 23% for those drivers 76+ years old. Drivers younger than 50 were cited less frequently than the average for Failure to Yield Right of Way, while those older than 50 were cited more frequently than the average for this factor.

Weather:

Provincially, about 9% of the drivers had Weather cited as a Contributing Factor by the officer in attendance at their casualty accidents in B.C. in 1982. For drivers under 66 years of age, Weather was generally cited at about the frequency of the provincial average. For drivers over 65, Weather was cited at a frequency somewhat less than the provincial average, and dropped to the provincial low of about 4% for those 76+ year old drivers.

Following too Closely:

Provincially, about 5% of the drivers in casualty accidents in B.C. in 1982 were, in the opinion of the attending officer, following too closely (tailgating), and this tailgating contriubted to the accident occurrence. Like Weather, for those drivers under 66 years of age, Following too Closely was generally cited about about the frequency of the provincial average, while for those drivers over 65 years of age, it was cited about 20% less frequently - that is, the citation frequency dropped from about 5% to about 4%.

Vehicle Fault:

Provincially, about 3% of the drivers in casualty accidents in B.C. in 1982 were driving, in the opinion of the attending officer, a vehicle with a mechanical fault that contributed to the accident occurrence. Like Driving Without Due Care, Alcohol Involvement, and Unsafe Speed, Vehicle Fault Contributing Factors were more associated with younger drivers in casualty accidents than with older drivers: this factor was cited most frequently for the 16-year old driver group at about 4%, and then generally decreased to below the provincial average for those drivers over 25 years of age.

DISCUSSION AND RECOMMENDATIONS

Before attemtping to dicusss this material, it must be noted that these Contributing Factors from MV104 do not necessarily represent the actual contributing factors to the casualty accidents, but rather are comprised of opinions of the attending police officers. Consequently, factors such as Alcohol Involvement and Vehicle Fault are probably underestimated, while other factors such as Weather may well be overestimated due to the difficulty in absolutely establishing the former and the self-evident nature of the latter. Nonetheless, some general conclusions abut the relationship between drivers' age and factors contributing to casualty traffic accidents can be drawn.

For drivers under 26 years of age, Driving Without Due Care was the most frequently cited contributing factor to casualty traffic accidents, and was noted for between 21-25% of the drivers. This factor was followed by Unsafe Speed (13-21%) and Alcohol Involvement (9-19%). In particular, Unsafe Speed was cited most frequently for the youngest driver, while Alcohol Involvement was cited most frequently for 19-year old drivers. Failure to Yield Right of Way and Weather were both cited for about 9% of the under-26 year old drivers, while Following too Closely was cited for about 5% and Vehicle Fault for abut 3% of these drivers. Weather, Following too Closely and Vehicle Fault were generally noted more often for the younger drivers in the 16-25 year old driver groupings.

For drivers between 26 and 50 years of age, Driving Without Due Care was also the most frequently cited contributing factor to casualty traffic accidents, and was cited for between 13-18% of these drivers, with a higher frequency of citation for the younger drivers within this age range. Unlike the 16-25 year old drivers where Unsafe Speed was the second most frequently cited factor, for the 25-50 year old driver groups, Alcohol Involvement was the second most frequently cited contributing factor: it ranged from between 14% of the 26-30 year old drivers to 8% for the 46-50 year old drivers. After Alcohol Involvement, Unsafe Speed was the next most frequently cited factor the 26-50 year groups, ranging from about 11% for the younger drivers to about 6% for the older drivers. Failure to Yield Right of Way and Weather both were cited for about 9% of the 26-50 year old drivers in casualty accidents, while Following too Closely ranged between 4-5% and Vehicle Fault ranged between 2-3%.

For drivers over 50 years of age, Failure to Yield Right of Way replaced Driving Without Due Care as the most frequently cited contributing factor to casualty traffic accidents, having been cited for between 14-24% of the drivers, with the younger drivers in this age range being associated with this factor less frequently than the older drivers. Driving Without Due Care was cited for between about 13-15% of the drivers, and did not appear to vary systematically with drivers' age within these 51+ year old driver groupings. Following Driving Without Due Care, Weather was the fifth most cited factor (7-8%, somewhat less for the oldest age groups), and this was followed by Alcohol Involvement (2-8%, decreasing with age) followed by Following too Closely (about 4-5%) and by Vehicle Fault (about 1-2%).

General Conclusions and Recommendations

From the above it is clear that the contributing factors to casualty traffic accidents under consideration varied substantially from driver age group to driver age group: Specifically, Driving Without Due Care, Unsafe Speed, Alcohol Involvement and Vehicle Fault were more frequently cited for younger drivers than for older drivers. For drivers between 26-50 years of age, the order of importance of contributing factors was similar to that for younger driers, except that Alcohol Involvement replaced Unsafe Speed as the second most frequently cited factor. On the other hand, for drivers over 50 years of age, Failure to Yield Right of Way was the most frequently cited factor among those factors examined, followed by Driving Without Due Care, Weather, Alcohol Involvement, Following too Closely and Vehicle Fault, in that order.

Clearly, while all of the Contributing Factors examined are important in causing casualty accidents, they vary in frequency from age group to age group. Therefore, public education campaigns ought to take these variations into consideration. For example, the fact that Unsafe Speed was noted more for the very young drivers than for older drivers, Alcohol Involvement was noted more for the young to middle-aged drivers, and Failure to Yield Right of Way noted most often for drivers over 50 years of age. This is the sort of information that could be used to produce different educational materials "aimed" at each of these driver age groups.

Towards Reducing Young Driver Traffic Accidents

TOWARD REDUCING YOUNG DRIVER TRAFFIC ACCIDENTS

British Columbia has an exceptionally high number of adolescents and young adults killed and injured in motor vehicle accidents.[1] This fact has recently produced some real concerns on the part of many members of the public. For example, as drinking driving is a well known contributor to traffic accidents, it is not surprising that the issues of young drivers and drinking drivers should be combined in an effort to reduce this tragic situation: in May, 1983 the British Columbia Medical Association in their convention at Kelowna B.C. recommended that the drinking age be increased from 19 to 21 years. However, within the 16-21 year old group of drivers, less than 1% are involved in alcohol-related casualty traffic accidents, while 5 to 10 times as many (depending on the exact age of the driver) are involved in casualty accidents where they were not drinking. Thus, the problem of traffic-related injuries is by no means thoroughly addressed by focussing on alcohol-related accidents. Further, young drivers do not abuse alcohol particularly more than do older drivers, yet they have a higher proportion of casualty accidents than do older drivers. This is not because their drinking or driving inexperience produces more accidents, but rather because they drive more frequently than do older drivers, especially at night when driving is most difficult.[2,3,4] Therefore, it is the purpose of this paper to consider and comment upon three approaches that might be used to reduce these accidents: raising the drinking age from 19 to 21; imposing a curfew on novice (not simply young) drivers; and increasing the driving age.

INCREASING THE DRINKING AGE TO 21

Certainly, raising the drinking age to 21 could reduce the number of alcohol-related casualty accidents associated with young drivers, and thus would reduce the overall number of accidents. For example, using 1982 casualty accident figures, it can be shown that raising the drinking age to 21 would reduce the number of drivers in the 16-20 year group in casualty accidents about 2.7% (See Appendix A of this paper)

However, there are a number of other consequences and considerations that must be addressed before atempting such an action. Some of the arguments for and against are:

Arguments For:

* Raising the drinking age from 19 to 21 might help to reduce adolescent and young adult alcoholism and thus reduce the social and medical problems associated with youthful alcoholism.

* It could be seen as a strong general statement about the dangers of excessive alcohol use that was instructive to the adult as well as youthful population.

Arguments Against:

* There is an ethical problem associated with restricting entire age groups from access to alcohol because of the behaviour of less than 1% of the registered drivers in those groups.[2]

* There would be a significant reduction in alcohol sale revenue for both the government and private sector.

* There would likely be problems enforcing a law that removed the already well established privilege of access to alcohol for 19 and 20 year olds.

* The enforcement of the law would place an additional burden on an already over-burdened Justice System. For example, the law would increase the number of potential offenders under the Liquor Act by adding all of the 19 and 20 year olds.

- * The law would extend the parens patriae of the state and convey the message to these youths that they are not considered responsible because of their age, as opposed to because of their actions. That is, the state would be restricting a group of people because of what they are (young) as opposed to restricting an individual within the context of a social contract between that individual and the state.

IMPOSING A CURFEW

Research has shown that a much more effective way of reducing casualties among young drivers is to impose curfews on their night-time driving.[3,5] This is because, as noted earlier, they tend to drive more frequently than do older drivers, especially at night.[2,3,4] For example, again using 1982 casualty accident data for B.C., it can be shown that a curfew law that was only 70% effective in restricting drivers in their first year of driving from being on the road between 8 p.m. and 4 a.m. would reduce the 16-20 year old drivers in these accidents by about 6.6%. A less restrictive curfew that disallowed drivers during their first year of driving from being on the road between 10 p.m. and 4 a.m. would reduce drivers in the 16-20 year old group who were in casualty accidents by about 4.9% (See Appendix A). Clearly, a curfew would reduce accidents more substantially than would raising the drinking age.

However, a curfew law for novice drivers also has pros and cons:

Arguments For:

- A curfew would be easier to enforce than would raising the drinking age, as all a police officer would have to do to obtain evidence would be to check the drivers' licence, whereas with changes in drinking legislation, blood alcohol evidence or some other proof of alcohol consumption and/or possession would be necessary. Further, the enforcement of curfews would not affect retail liquor outlets, bars, pubs and the like, while these establishments would be burdened with both enforcement problems and loss of revenue if the drinking age were raised.
- If a curfew applied to drivers in their first year of driving, it would only be affecting a group of people (i.e. the drivers) who voluntarily take on the restriction as a part of obtaining a licence, while raising the drinking age would arbitrarily affect an entire age group, irrespective of their behaviour or wishes.
- Penalties for curfew violation would not have to be handled through the courts but rather could be dealt with administratively by the Superintendent of Motor Vehicles.
- Removing novice drivers from the road at night would give them more time to gain driving experience before attempting more difficult night-time driving.
- A curfew would reduce the number of night-time drivers and thus presumably further reduce accidents.
- A curfew on novice drivers would probably reduce the accident rate of older novice drivers.
- A curfew would not extend the parens patriae of the state, as it would not be age related.

Arguments Against:

- A curfew law could cause problems in its wording and exact application. In the United States there are 12 states with curfew laws, each version being different in terms of hours, penalties, who the laws apply to, what exceptions are allowed and so on. Further, the effectiveness of these laws is entirely dependent on their breadth, and that in turn is dependant on their form - a curfew on novice drivers for the first six months of their driving would have perhaps only half the effect of one for the first year. In short, the writing of a curfew law would be more difficult than simply extending current drinking restrictions.

- A curfew law regulates people (novice drivers) who were previously not regulated, both extending the control of the state on the individual and possibly causing a burden for novice drivers with legitimate and necessary reasons for being on the road at night.
- Because young drivers tend to be novice drivers, a curfew law might increase adults' burden of responsibility for the transportation of youths.
- Bars and pubs might lose some business due to people who are novice drivers leaving early. On the other hand, those leaving early might drink less.

RAISING THE DRIVING AGE:

A third approach to the reduction of casualties among young drivers would be to raise the driving age. For example, using B.C. 1982 figures, it can be shown that 16-year old drivers in casualty accidents account for about 12.4% of the casualty accident drivers between the ages of 16-20, while 17 year old drivers comprise another 18.9%. Thus, if the driving age were raised to 18, young drivers in casualty accidents could be reduced as much as 31.3%.

Of course, raising the driving age would not absolutely stop young people from driving - in 1982 there were 180 15-year old drivers in casualty accidents - but it would certainly reduce the numbers further than would either raising the drinking age or the imposition of curfews. In addition, it is important to note when considering this option is that it is age, much more than driving experience, that predicts casualty traffic accident involvement.[2]

However, while this would be the most effective way of reducing youthful casualty traffic accidents, again there are other considerations:

Arguments For:

- Similar to a curfew law, this would not have many of the drawbacks of raising the drinking age: enforcement would be relatively straightforward, most of the administration could be handled through the Ministry of Transportation, as opposed to the Courts and there would be no loss of public or private revenue associated with alcohol consumption.
- It would be easier to simply extend the current law on driving age than to try to write and enforce a new law on curfews.

Arguments Against:

- Raising the driving age would place restrictions on a group previously not restricted, possibly causing a burden on young persons who legitimately need to drive at that age.
- It would increase the adults' burden of responsibility for the transportation of youths, as well as extending youths period of dependency.
- It would probably increase the number of youths driving without a licence.
- It would increase the parens patriae of the state and convey the message to youths that they are not responsible.

CONCLUSIONS AND RECOMMENDATIONS

Driver age is the most reliable predictor of being in a casualty acident - the younger the drivers, the more likely that they will be in a crash where they are injured or killed,[2] and British Columbia has a higher rate of youthful driver traffic accidents than most places in the world.[1] Clearly, the problem needs to be addressed. Within this paper the three approacnes of raising the drinking age, imposing curfews, and raising the driving age have been briefly considered.

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APPENDIX A

Calculating the Effects of Raising the Drinking Age:

From the Traffic Accident Report Forms (MV104) for casualty accidents in 1982, one can determine that, for "at fault" drivers between 16-18 years of age, 15.5% (452) of the drivers were thought to have been drinking, while for "at fault" drivers between 19-20 years, 24.0% (662) were thought to have been drinking. If one assumes the effect of a law raising the drinking age to 21 was to reduce the proportion of drinking drivers for the 19-20 year old group to the level of the 16-18 year old groups, then that would mean a reduction of 19-20 year old drivers "at fault" in alcohol-related casualty traffic accidents by 220 drivers or about 2.7% of the 8,057 drivers between 16-20 years of age in these accidents.

Calculating the Effects of Curfews:

Using the same data base as above, and assuming the curfew was only 70% effective (i.e. only 7 out of 10 drivers in their first year of driving obeyed it), the calculation of the effects of a curfew from 8 p.m. to 4 a.m. goes as follows:

1. Using figures from the CounterAttack Brief Report #10, on driving experience, one can estimate that about 40% of the 16-18 year old drivers and about 14% of the 19-20 year old drivers are in their first year of driving and thus would be affected by the curfew. At a 70% effectiveness level, it follows that during curfew hours 28% of the 16-18 year old drivers and 10% of the 19-20 year old drivers would be off

of the road who otherwise would be driving if there was no curfew.

2. In 1982 there were 1,488 16-18 year old drivers in casualty accidents between 8 p.m. and 4 a.m., and 1,444 19-20 year old drivers in casualty accidents between these hours. Taking 28% of the first number and adding that to 10% of the second, one finds that 6.6% (531) of the 8,057 16-20 year old drivers would not have been on the road with a 8 p.m. - 4 a.m. curfew.

The calculation of a curfew from 10 p.m. - 4 a.m. is done in a similar manner, except the figures for the number of 16-18 year old drivers in casualty accidents between these hours was 1,013, while the number of 19-20 year olds was 1,104. From this, there were 394 or 4.9% of the total of 8,057 youthful drivers who were in casualty accidents who would not be on the road with a 10 p.m. - 4 a.m. curfew.

A Note on the Calculation of Traffic Accident Reduction and Raising the Drinking age to 21 Years

A NOTE ON THE CALCULATION OF TRAFFIC ACCIDENT REDUCTION AND RAISING THE DRINKING AGE TO 21 YEARS

In his book, Alcohol, Young Drivers, and Traffic Accidents, Wagenaar states "Approximately 20% of all alcohol-related crashes involving young drivers can be prevented by removing legal access to alcoholic beverages." (page 101). However, it is necessary to place this reduction in perspective:

In 1982, 18.9% of 19 year old drivers in casualty traffic accidents were thought to have been drinking by the investigating officer, while the figure for 20 year old drivers was 17.1%. A 20% reduction in these figures would represent a 3.8% drop in 19 year old drivers in casualty traffic accidents and a 3.4% reduction for 20 year old drivers, which translates into about 75 fewer 19 year old and 62 fewer 20 year old drivers in these accidents. This in turn translates into a 1.7% reduction in drivers in casualty accidents in the 16-21 year old driver group, and a 0.37% overall reduction in drivers in casualty traffic accidents.

It should be noted that Mercer in Towards Reducing Young Driver Traffic Accidents calculated that raising the drinking age to 21 from 19 would produce about a 3% reduction in 16-21 year old drivers in casualty traffic accidents (as opposed to 1.7%). The reason for this was that it was assumed that alcohol-related casualty accidents would also reduce for drivers younger than 19 years of age. Using Wagenaar's 20% estimate, and applying it to the entire group of 16-20 year old drivers, the calculations are as follows:

Driver Age	A % casualty accidents where driver thought to be drinking B.C., 1982	B 20% of A	C Actual Number of drivers affected
16	8.9	1.8	18
17	9.5	1.9	29
18	15.6	3.1	55
19	18.9	3.8	75
20	17.1	3.4	62
			Total 239

Total # 16-20 year old drivers in casualty traffic accidents, B.C., 1982 = 8,122

$$\frac{239}{8,122} \times \frac{100}{1} = \underline{2.9}$$

Total # drivers in casualty traffic, B.C., 1982 = 36,699

$$\frac{239}{36,699} \times \frac{100}{1} = \underline{0.65}$$

Therefore from the above, assuming an overal 20% reduction in drivers in alcohol-related casualty traffic accidents in the 16-20 year old group, there would be about a 2.9% reduction in drivers in casualty traffic accidents for that group and an overall 0.65% reduction in drivers in casualty traffic accidents if the drinking age were raised from 19 to 21 years.

In short, raising the drinking age from 19 to 21 would probably reduce casualty traffic accidents for 16-20 year old drivers by no more than 3%.

VICTIMS OF TRAFFIC ACCIDENTS

Traffic Casualty Types and Locations:
Drinking Driver vs Sober Driver Accidents
British Columbia, 1982

Passengers in Casualty Traffic Accidents:
Drinking Drivers vs Sober Drivers
British Columbia

Pedestrian Casualty Traffic Accident Facts
British Columbia, 1983

Traffic Casualty Types and locations:
Drinking Driver vs Sober Driver Accidents
British Columbia, 1982

SUMMARY

In sum, while sober drivers cause about four times the number of casualties as do drinking drivers, the most frequent casualty for both sober driver and drinking driver accidents is the driver himself. However, the next most frequently noted source of casualties for sober driver accidents is persons in other vehicles, while for drinking driver accidents it is the drinking driver's passengers. Knowing this, it would seem reasonable to produce a public education campaign which emphasizes the danger of being a passenger with a drinking driver. In addition, resources should be directed toward understanding and reducing the 80% of accidents and casualties not associated with drinking driving.

FIGURE 1.

TRAFFIC CASUALTIES, B.C., 1982.

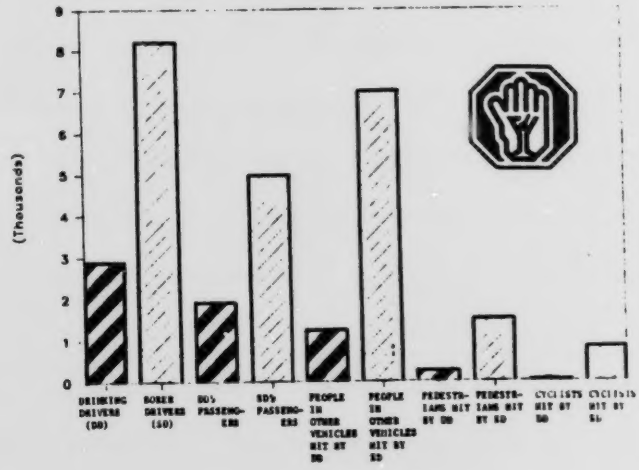


FIGURE 2.

DRINKING DRIVER CASUALTIES.

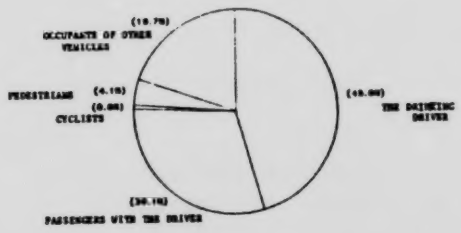
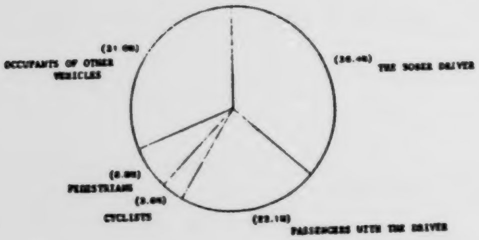


FIGURE 3.

SOBER DRIVER CASUALTIES.



TRAFFIC CASUALTY TYPES AND LOCATIONS:
DRINKING DRIVER VS SOBER DRIVER ACCIDENTS BRITISH COLUMBIA, 1982

In order to design traffic safety public education materials it is necessary to define "at risk" or "target" groups. Therefore it is the purpose of this paper to briefly compare traffic accident casualties associated with drinking drivers with those casualties associated with traffic accidents where there were no drinking drivers.[1]

From Table 1 it can be seen that about 19% of the traffic accidents and about 22% of the traffic accident casualties in B.C. in 1982 came from accidents where one or more drivers were thought to have been drinking. Thus, from both Table 1 and Figure 1 it is clear that sober drivers account for approximately four times the number of accidents and casualties as do drinking drivers. However, from Figures 2 and 3 it is evident that the proportional distribution of casualties differs across these two types of accidents.

Considering casualty accidents where one or more drivers were drinking, in 1982, there were 4,683 drinking drivers who had a total of 4,597 casualty accidents and in sum they produced 6,437 casualties. Of these casualties, 45.6% were the drinking driver, 30.1% were passengers in the vehicle with the drinking driver, 19.7% were persons in other vehicles where the driver was not drinking, 4.1% were pedestrians, and 0.6% were cyclists. In other words, about 76% of the casualties were in the drinking driver's vehicle.

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[1] The information in this report comes from an examination of all casualties reported on Traffic Accident Report Forms (MV104) completed by the attending police officer at casualty traffic accidents, B.C., 1982. The Motor Vehicle Department of the Ministry of Transportation and Highways of British Columbia supplied these computer-readable records, and any figures produced by the department supercedes these figures.

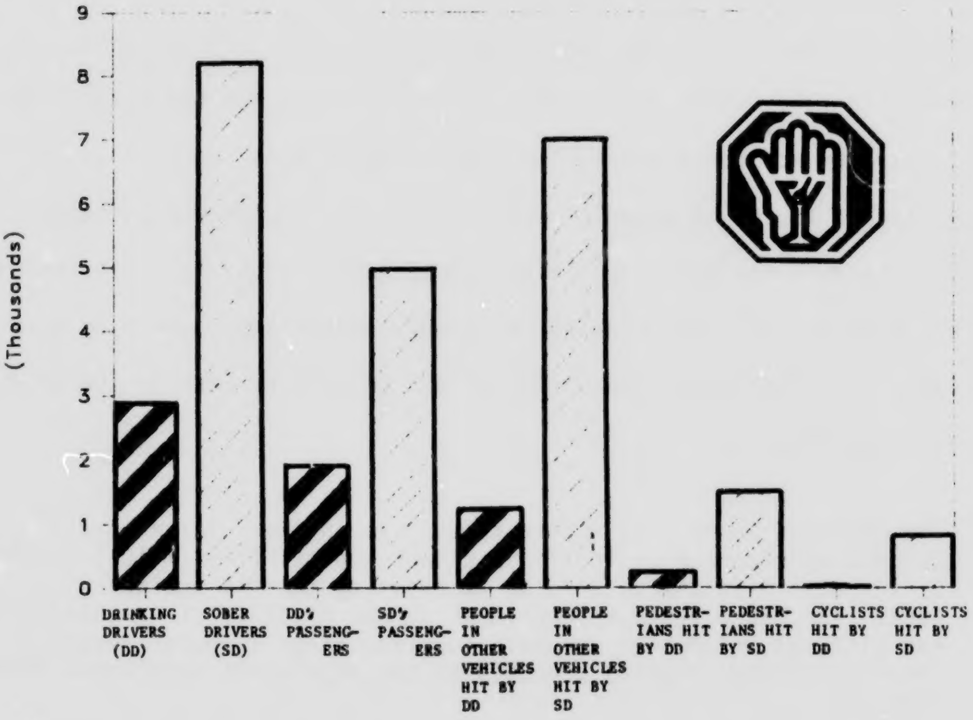
TABLE 1

Traffic Casualties
British Columbia, 1982

	Drinking Driver Casualty Accidents	Sober Driver Casualty Accidents	% of Total Drinking Associated
# Accidents	4,597	19,665	18.9%
# Drivers	4,683	19,665	19.2%
Drivers	2,929	8,232	26.2%
Passengers in Driver's Car	1,939	5,001	27.9%
Passengers in Other Vehicles	1,266	7,031	15.3%
Pedestrians	263	1,539	14.6%
Cyclists	40	824	4.6%
TOTAL CASUALTIES	6,437	22,609	22.1%
% Accidents Single Vehicle Only	58.0%	36.8%	

FIGURE 1.

TRAFFIC CASUALTIES, B.C., 1982.



On the other hand, considering accidents where all of the drivers were sober, in 1982, there were 19,665 drivers who were not drinking and who caused casualty accidents (i.e. they were considered as driver #1 on the MV104). In sum they produced 22,609 casualties and of these, 36.4% were themselves, 22.1% were passengers in their vehicles, 31.0% were persons in other vehicles, 6.8% were pedestrians, and 3.6% were cyclists. In other words, about 59% of these casualties were in the sober driver's vehicle.

FIGURE 2.

DRINKING DRIVER CASUALTIES.

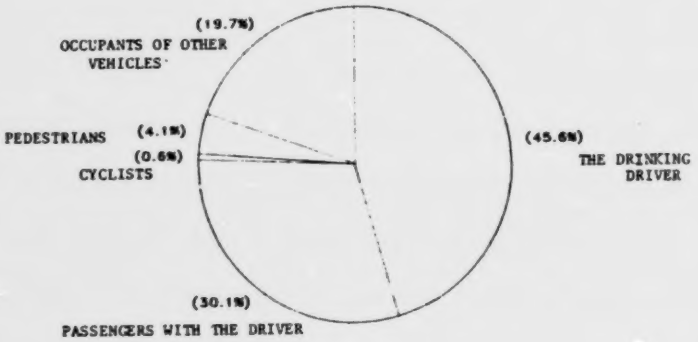
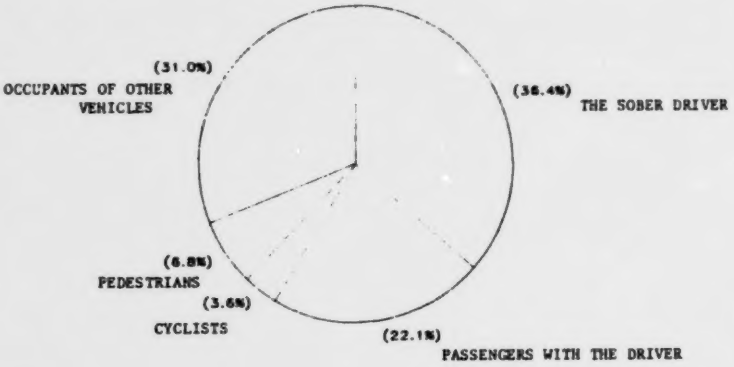


FIGURE 3.

SOBER DRIVER CASUALTIES.

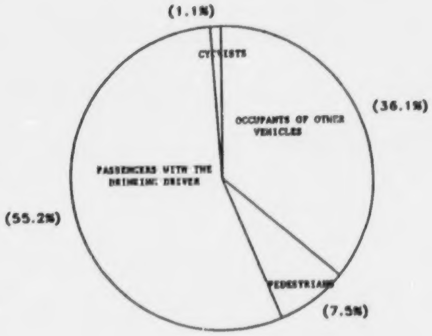


The most reasonable explanation for the higher proportion of casualties from drinking driving accidents in the driver's vehicle than the proportion of casualties in the driver's vehicle in a sober driver accident is that drinking driving accidents are more likely to be single vehicle accidents (58.0%) than are sober driver accidents (36.8%). As noted in Alcohol-Related Casualty Traffic Accidents in British Columbia (Ministry of Attorney General, 1984), often the drinking driver simply drives off the road when the road curves. Further, the fact that drinking drivers hit proportionally fewer pedestrians and cyclists than do sober drivers is probably best explained by the fact that the majority of drinking driving accidents occur after dark when there are relatively few pedestrians and cyclists on the road.

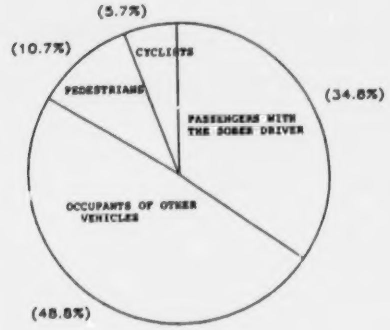
In sum, while sober drivers cause about four times the number of casualties as do drinking drivers, the most frequent casualty for both sober driver and drinking driver accidents is the driver himself. However, the next most frequently noted source of casualties for sober driver accidents is persons in other vehicles, while for drinking driver accidents it is the drinking driver's passengers. Knowing this, it would seem reasonable to produce a public education campaign which emphasizes the danger of being a passenger with a drinking driver. In addition, resources should be directed toward understanding and reducing the 80% of accidents and casualties not associated with drinking driving.

Passengers in Casualty Traffic Accidents: Drinking Drivers vs Sober Drivers British Columbia

SUMMARY



Drinking Drivers' Victims
British Columbia, 1982.



Sober Drivers' Victims
British Columbia, 1982.

The drinking driver in casualty traffic accidents, when compared to the sober driver in casualty traffic accidents, is more likely to be male, to be younger, to carry more passengers, to carry passengers more often, and to carry more male passengers. On the other hand, both the drinking driver and sober driver in these accidents tend to be, on the average, older than their passengers.

Turning to a comparison of male and female drinking drivers in casualty traffic accidents, the female drinking driver is more likely to be carrying passengers, to be carrying more passengers, and to be carrying more female passengers.

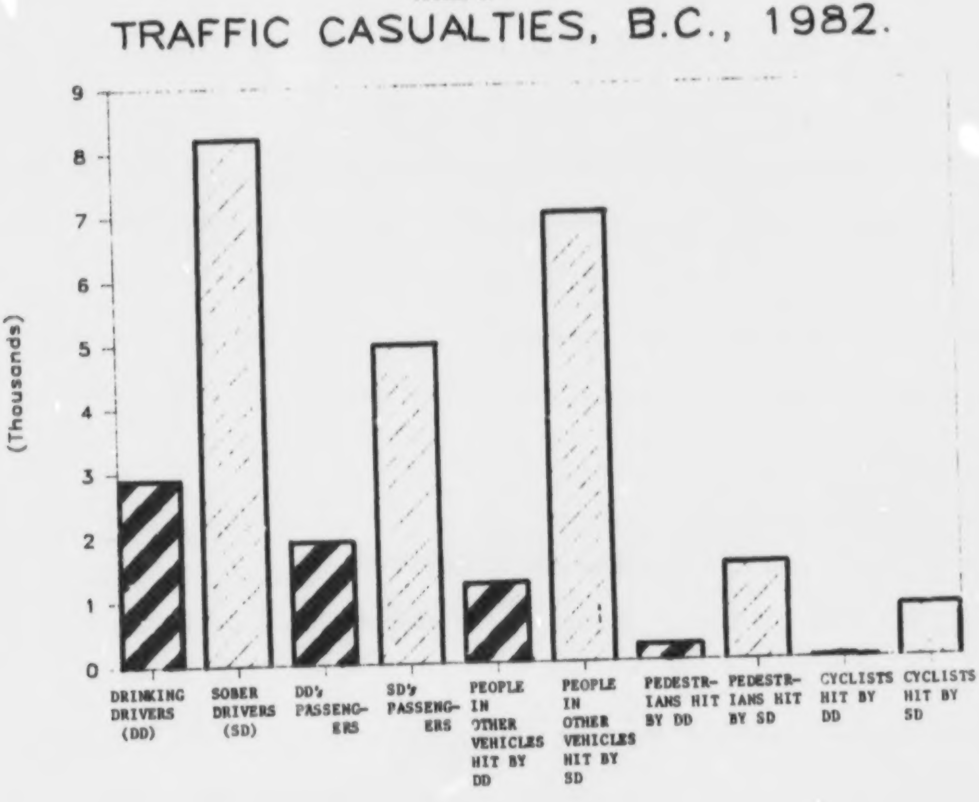
Finally, generally the younger the driver in these accidents, the more likely the driver will by carrying a greater number of passengers, although this relationship is stronger for male drinking drivers than for male sober drivers.

If one were to roughly characterize the drinking driving casualty traffic accident from these data, it would involve a young male carrying passengers, two out of three who are male, and all of whom are younger than he.

PASSENGERS IN CASUALTY TRAFFIC ACCDIENTS:
DRINKING DRIVERS vs SOBER DRIVERS

In Traffic Casualty Types and Locations: Drinking Drivers vs Sober Drivers (Ministry of Attorney General, May, 1984) it was noted that the single most frequently injured or killed category of persons in a drinking driving accident (excluding the driver) is the passenger in the drinking driver's vehicle, while for sober driver accidents (excluding the driver) it is occupants of other vehicles (see graph below).

FIGURE 1.



As the purpose of the CounterAttack program is to reduce casualties associated with drinking driving, and as over half of drinking drivers' victims are passengers in the drinking drivers' vehicles, then it would be useful to examine some of the characteristics of these passengers. This in turn may lead to some insights as to how to persuade people not to ride with a drinking driver. Therefore, it is the purpose of this paper to compare and contrast some of the characteristics of passengers in drinking driving casualty traffic accidents with those in casualty traffic accidents where alcohol was not thought to be involved.

METHOD

The Traffic Accident Report Forms (MV104)[1] completed by the attending police officer at casualty traffic accidents were divided into those where the officer indicated the driver may have been drinking (i.e., alcohol was a primary, secondary or tertiary contributing factor) and those where there was no indication of alcohol on the form. Passengers with these two categories of drivers were then examined in terms of driver and passenger age and gender as well as in terms of number of passengers in the casualty traffic accidents.

RESULTS AND DISCUSSION

The pie charts give some notion of the danger that a passenger with a drinking driver risks.

Table 1 shows that the drinking driver in casualty traffic accidents,

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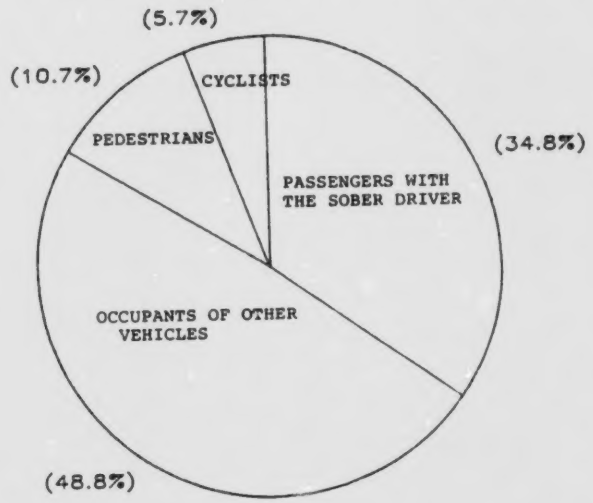
[1] These reports are put into computer-readable form by the Motor Vehicle Department of the Ministry of Transportation and Highways. As that Department is constantly updating this information, any figures produced by that Department supersede those in this report.

Sober Drivers' Victims

British Columbia, 1982.



Drinking Drivers' Victims

British Columbia, 1982.

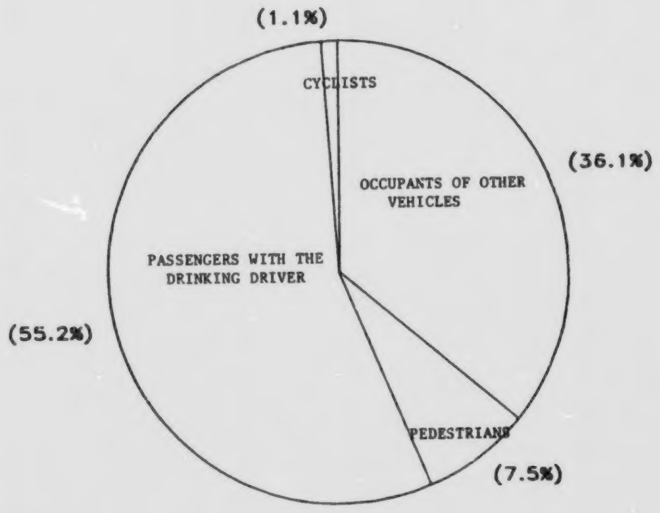


TABLE 1

Passengers in Casualty Traffic Accidents British Columbia, 1983

	OVERALL		MALE DRIVERS		FEMALE DRIVERS	
VARIABLE	ALCOHOL-RELATED CASUALTY ACCIDENT (N = 3,508)	SOBER CASUALTY ACCIDENT (N = 18,381)	ALCOHOL-RELATED CASUALTY ACCIDENT (N = 3,036)	SOBER CASUALTY ACCIDENT (N = 12,677)	ALCOHOL-RELATED CASUALTY ACCIDENT (N = 456)	SOBER CASUALTY ACCIDENT (N = 5,584)
Average Driver's Age (Years)	28.96	33.58	29.01	33.22	28.59	34.43
Average # Passengers	0.68	0.53	0.66	0.55	0.75	0.52
Average # Male Passengers	0.44	0.25	0.44	0.28	0.42	0.21
Average # Female Passengers	0.23	0.27	0.21	0.27	0.32	0.30
Average Passengers Age (Years)	21.65	25.03	21.61	26.12	22.31	23.17
Average Male Passengers Age (Years)	21.70	22.22	21.44	22.04	23.57	23.21
Average Female Passengers Age (Years)	21.33	27.41	21.63	29.94	20.33	22.40
% Accidents with Passengers	43%	36%	43%	37%	46%	34%
% Accidents with Male Passengers	32%	20%	32%	21%	31%	17%
% Accidents with Female Passengers	18%	21%	17%	21%	24%	23%

when compared to the sober driver in casualty traffic accidents, is more likely to be male, to be younger, to carry more passengers more often, and to carry more male passengers. On the other hand, both the drinking driver and sober driver in these accidents tend to be, on the average, older than their passengers.

Again, from Table 1, comparing male and female drinking drivers in casualty traffic accidents, the female drinking driver is more likely to be carrying more passengers, to be carrying more passengers, and to be carrying more female passengers.

Finally, generally the younger the driver in these accidents, the more likely the driver will be carrying a greater number of passengers, although this relationship is stronger for male drinking drivers than for male sober drivers. To illustrate, the Pearson's product-moment correlation cooefficient between drivers' age and the number of passengers for male drinking driver is -.21, (p=.000) while for male sober drivers it is -.06, (p=.000). For both sober and drinking female drivers the correlation between drivers' age and number of passengers is -.12. For example, of the 16 year old male sober drivers in casualty traffic accidents, 50% had passengers, while for the 16 year old male drinking drivers in casualty traffic accidents, 59% had passengers, while the percentages carrying passengers sober _vs_ drinking drivers in the 19 year old, 21-25 year old and 41-45 year old groups were 45% _vs_ 57%, 37% _vs_ 48%, and 31% _vs_ 29%. If one were to roughly characterize the drinking driving casualty accident from these data, it would involve a young male carrying passengers, two out of three who are male, and all of whom are younger than he.

Pedestrian Casualty Traffic Accident Facts
British Columbia, 1983

SUMMARY

The following is a presentation of facts concerning traffic accidents involving pedestrians in British Columbia, 1983. The highlights are:

- In 1983 there were 1,977 pedestrian casualty accidents resulting in 2,092 casualties. 12% were hit-and-run.
- Two thirds of these casualties were male, and adolescents and young adults made up the bulk of all pedestrian casualties.
- Twenty-four percent of these casualty accidents were caused by pedestrian error, 33% occurred when the pedestrian was crossing with no crosswalk or signal, and about half occurred at intersections.
- Slightly more occurred in Winter, fewer in Summer.
- Fridays and Saturdays produced high numbers of pedestrian casualty accidents, as did all afternoons.
- As one would expect, this is a municipal, as opposed to rural phenomenon. For example, while pedestrian casualty accidents comprised 8.6% of all casualty accidents provincially, they made up 16% of those in the Vancouver area and generally less than 5% in rural areas.
- Probably because these accidents occur during times of the day when there are relatively few drinking drivers on the roads, relatively few involve a drinking driver.
- Pedestrian casualty accidents will probably increase in relation to other sorts of accidents, and this in turn will probably necessitate a reassessment of police resources and priorities regarding same.

The data used in this presentation come from a computer analysis of Traffic Accident Report Forms (MV104) completed by attending officers at casualty traffic accidents and were supplied by the Motor Vehicle Department of the Ministry of Transportation and Highways. Any data produced by that Department supercedes information reported herein.*

Trends:

From Figure 1 it can be seen that the total number of casualty traffic accidents involving pedestrians has remained constant over the past few years, while the number of casualty traffic accidents not involving pedestrians has been decreasing since 1981. Therefore the proportion of these accidents involving pedestrians has been increasing.

Contributing Factors:

From the MV104 "Contributing Factor" codes, the following was drawn by examining all "Contributing Factors" to each pedestrian casualty accident for 1983:

	PEDESTRIAN ERROR	23.9%
Refers to Drivers	FAILURE TO YIELD	23.9%
	W/O DUE CARE	17.3%
	ALCOHOL	12.6%
	WEATHER	7.5%
	SPEEDING	4.0%

Total # Casualty Pedestrian Accidents, 1983 = 1977

Precollision Behaviour of Vehicle:

GOING STRAIGHT	64.3%
RIGHT TURN	8.4%
LEFT TURN	13.2%
BACKING	4.3%

Pedestrian Age:

From Figure 2 it can be seen that the largest number of pedestrian victims fall between 10 and 25 years of age. This probably represents the largest group of pedestrians.

Pedestrian Sex:

While at the time of writing it is impossible to know exactly, probably about 33% of pedestrian victims are female and the remainder male.

Pedestrian Action:

CROSSING WITH SIGNAL	14.9%
CROSSING AGAINST SIGNAL	6.0%
CROSSING AT CROSSWALK (no signals)	16.4%
CROSSING NO SIGNALS NO CROSSWALK	33.2%
WALKING WITH TRAFFIC	6.2%
WALKING AGAINST TRAFFIC	3.2%
EMERGING FROM BEHIND VEHICLE	9.3%
WORKING ON ROAD	1.0%
PLAYING ON ROAD	3.7%
ON SIDEWALK	2.9%

*NOTE: Except where noted otherwise, all numbers were taken from the 1983 MV104 computer tape.

Figure 1

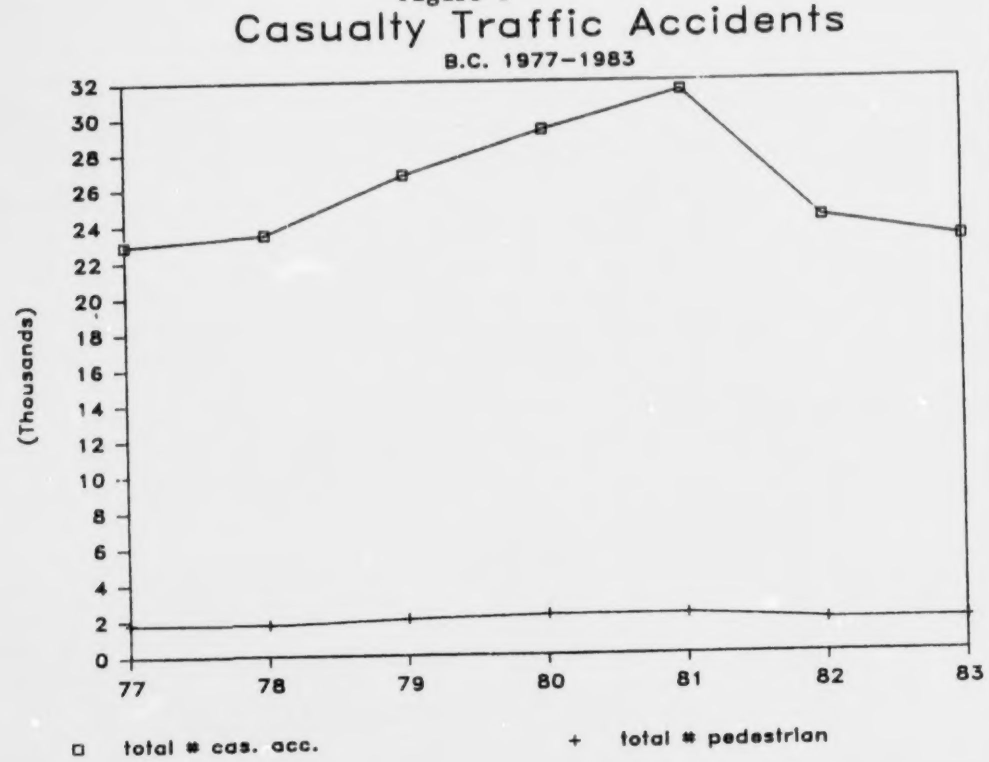
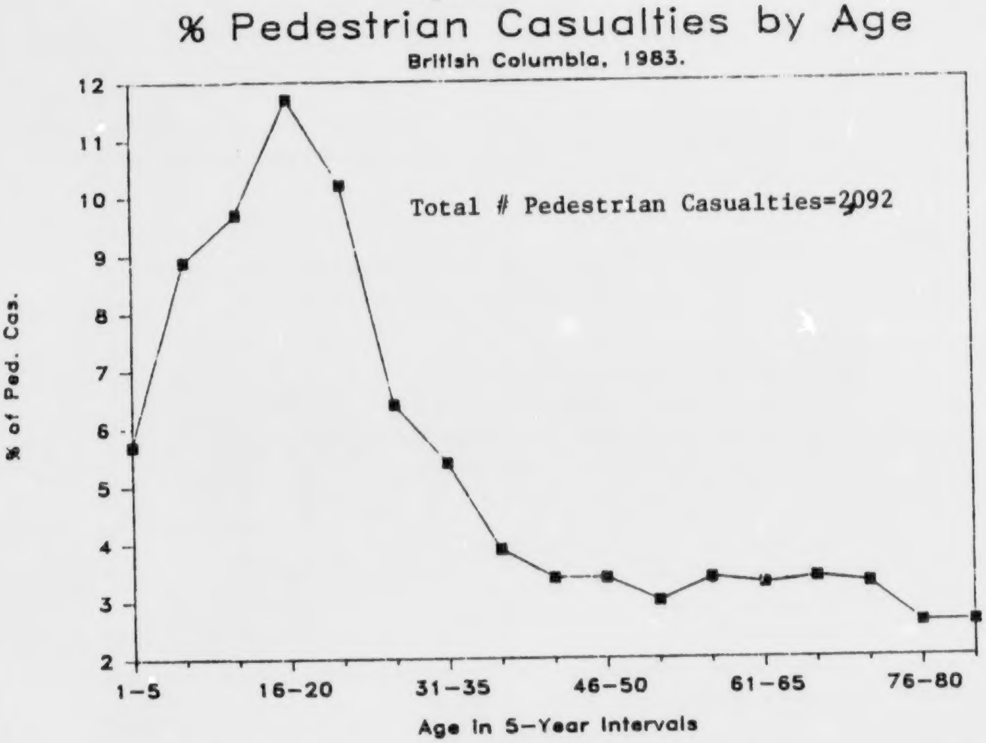


Figure 2



Posted Speed Zone:

50 kph	53.1%
100 kph	26.7%

Hit-and-Run:

While 3.9% of non-pedestrian casualty accidents are hit-and-run, fully 12.4% of pedestrian casualty accidents fall into this category- a difference of over 300%.

Fatality:

Pedestrian casualty accidents result in fatalities in about 4.1% of the cases, while non-pedestrian casualty accidents produce fatalities about 2.1% of the time- almost 100% difference.

Land Use in Area:

SCHOOL PLAYGROUND	5.1%
FAMILY RESIDENTIAL	29.4%
APARTMENT RESIDENTIAL	7.8%
BUSINESS/SHOPPING	49.5%
INDUSTRIAL/MANUFACTURING	2.4%
AGRICULTURAL	3.9%
CAMPGROUND/PARK	1.8%

Weather:

CLEAR	48.6%
CLOUDY	27.7%
RAIN	22.5%
SNOW	1.0%

Month:

Overall there is very little variation in the rates for these accidents from month to month. Generally, the months of bad weather (October through March) each produce around 9%, while the more pleasant months (April through September) each produce about 7%.

Day of Week:

MONDAY	12.7%
TUESDAY	15.1%
WEDNESDAY	15.5%
THURSDAY	15.2%
FRIDAY	16.4%
SATURDAY	16.0%
SUNDAY	9.0%

Time of Day:

MIDNIGHT-2AM	2AM-4AM	4AM-6AM	6AM-8AM	8AM-10AM	10AM-NOON
5.0%	3.2%	0.6%	4.3%	5.7%	8.3%

NOON-2PM	2PM-4PM	4PM-6PM	6PM-8PM	8PM-10PM	10PM-MIDNIGHT
10.1%	17.3%	17.0%	12.2%	8.3%	8.0%

Geographic Locations:

The locations listed below correspond to police reporting areas, as opposed to specific towns. For example, the Kamloops Municipal listing includes all R.C.M.P. municipal detachments reporting in the entire Kamloops subdivision.

POLICE GROUP	TOTAL # CASUALTY ACCIDENTS	% OF TOTAL INVOLVING PEDESTRIANS
KELOWNA MUNICIPAL	903	5.8%
KELOWNA RURAL	1087	3.5%
KAMLOOPS MUNICIPAL	587	9.2%
KAMLOOPS RURAL	846	2.2%
NELSON MUNICIPAL	161	10.6%
NELSON RURAL	873	2.6%
PR. GEORGE MUNICIPAL	613	10.9%
PR. GEORGE RURAL	786	2.0%
PR. RUPERT MUNICIPAL	209	15.8%
PR. RUPERT RURAL	440	4.3%
RCMP DIST. 1 MUNICIPAL	6291	8.4%
RCMP DIST. 1 RURAL	717	2.9%
VICTORIA MUNICIPAL	645	7.8%
VICTORIA RURAL	842	5.9%
COURTNEY MUNICIPAL	408	8.3%
COURTNEY RURAL	750	3.3%
FREEWAY RCMP	553	1.6%
VAN. AREA INDEPENDENT	4801	16.3%
VIC. AREA INDEPENDENT	1469	9.9%
NELSON AREA IND.	43	16.3%
OTHER POLICE	18	11.1%
PROVINCIAL TOTAL	23047	8.6%

Clearly this is a municipal, as opposed to rural, problem.

LOCATIONS AND CAUSES OF TRAFFIC ACCIDENTS

Casualty Traffic Accident Locations:
British Columbia, 1983

Casualty Traffic Accidents in Vancouver City
Victoria and North Vancouver, 1983

Casualty Traffic Accident Causes by
Police Reporting Area,
British Columbia 1983

Casualty Traffic Accident Locations: British Columbia, 1983

SUMMARY

The two types of locations that produce the largest numbers of casualty traffic accidents are at intersections (43%) and between intersections (42%). The former are more urban phenomena, and are most often caused by Failure to Yield The Right of Way, while the latter are more rural and are caused by Driving Without Due Care, Alcohol Involvement, and Speeding, in that order. Because intersection accidents occur at known locations and occur because of specific driving behaviours that are not linked to "lifestyle", they can probably be more easily reduced through law enforcement and public information efforts than can "between intersection" accidents, which occur at more locations and are caused by the "lifestyle" and somewhat socially accepted behaviours of drinking and driving above the speed limit.

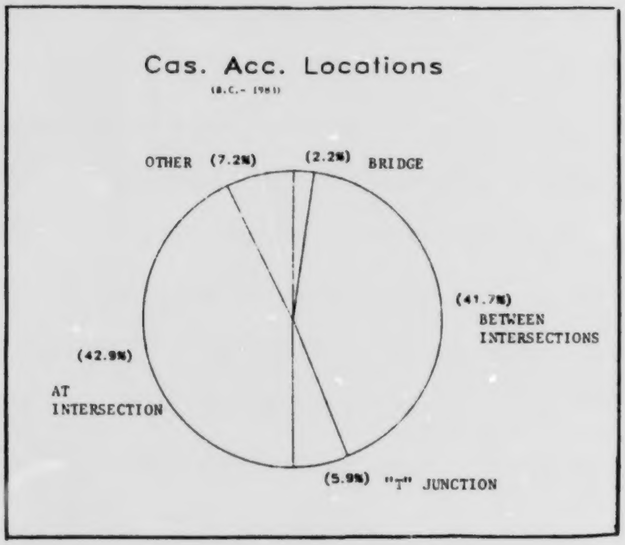


TABLE 5
CASUALTY TRAFFIC ACCIDENT LOCATION BY COMMON CONTRIBUTING FACTORS
BRITISH COLUMBIA, 1983

	FACTORS (%)							
Location	Total # Accidents	Driving Without Due Care	Alcohol Involved	Speeding	Failure to Yield Right of Way	Weather	Tail-gating	Vehicle Fault
At Intersection	9,679	28	13	11	35	8	9	3
Between inter-sections	9,400	33	24	21	3	13	6	5
"T" Junction	1,330	31	11	14	25	7	8	5
Bridge	495	29	20	21	2	20	15	6
Other	1,633	32	21	21	5	12	5	7
Provincial Total	22,537	30.4%	17.8%	15.8%	17.5%	10.5%	7.4%	4.4%

CASUALTY TRAFFIC ACCIDENT LOCATION
BRITISH COLUMBIA, 1983

In order to most effectively deploy the traffic accident prevention resources of law enforcement and public education, it is necessary to have a clear picture of the general types of locations that are most frequently associated with these accidents. Consequently, it is the purpose of this paper to document some of the characteristics of casualty traffic accidents (i.e., an accident producing injury and/or death) in terms of the location categories of: at intersections, between intersections, "T" junctions; bridges; and "other". The data for this study were taken from the Traffic Accident Report Forms (MV104) completed by the attending police officer at casualty traffic accidents and were compiled into computer readable form by the Motor Vehicle Department of the Ministry of Transportation and Highways of British Columbia. It should be noted that, as these data are constantly being updated by the Motor Vehicle Department, figures produced by that Department supercede any presented herein.

RESULTS

General Location: Urban/Rural

As can be seen from Figure 1, of the over 22,000 casualty traffic accidents where complete data was available, about 43% occurred at intersections, 42% between intersections, 6% at "T" junctions where a road intersects with, but does not cross another, 2% at bridges, and the remainder at a number of other locations. However, these proportions

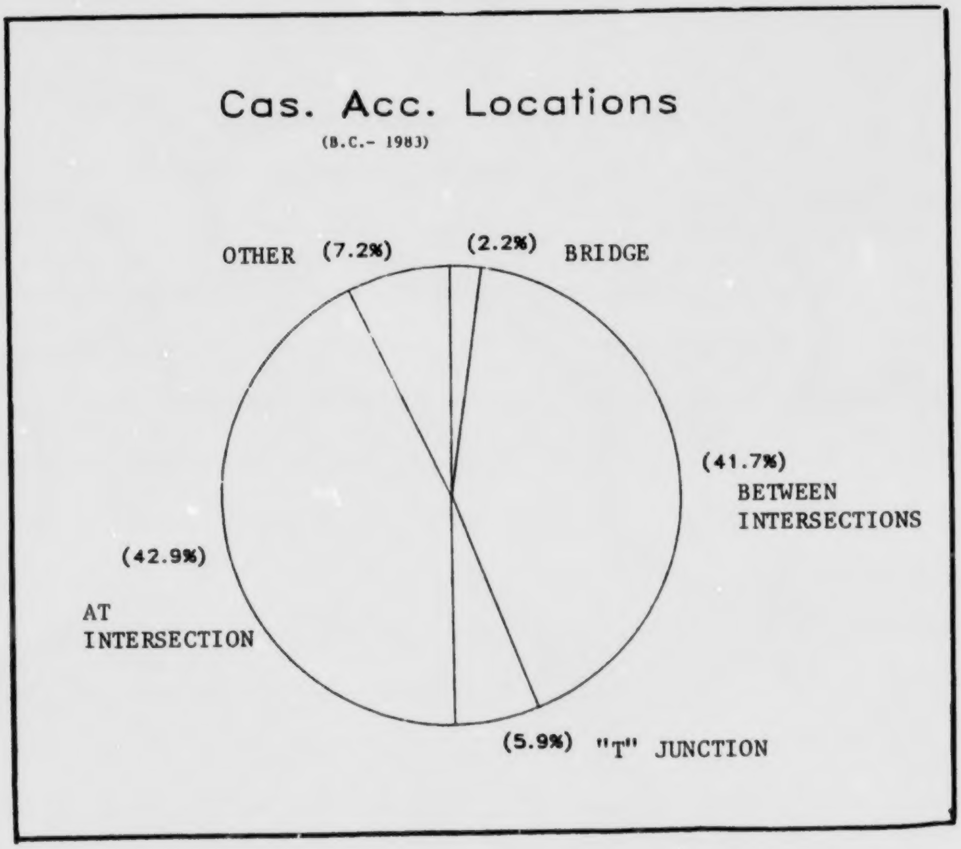


FIGURE 1

29% of Total

71% of Total

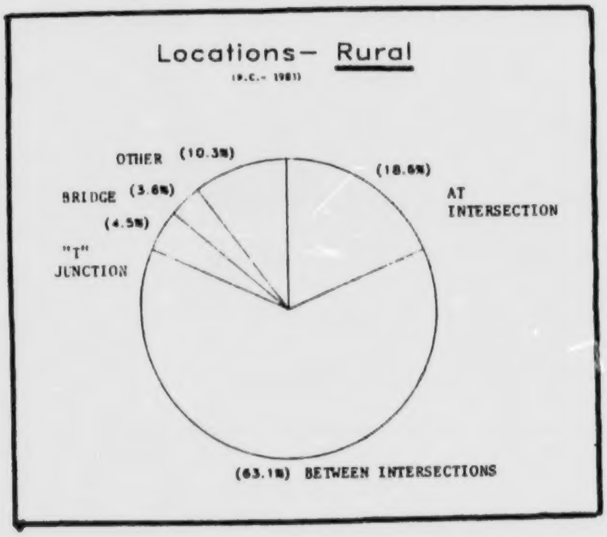


FIGURE 2

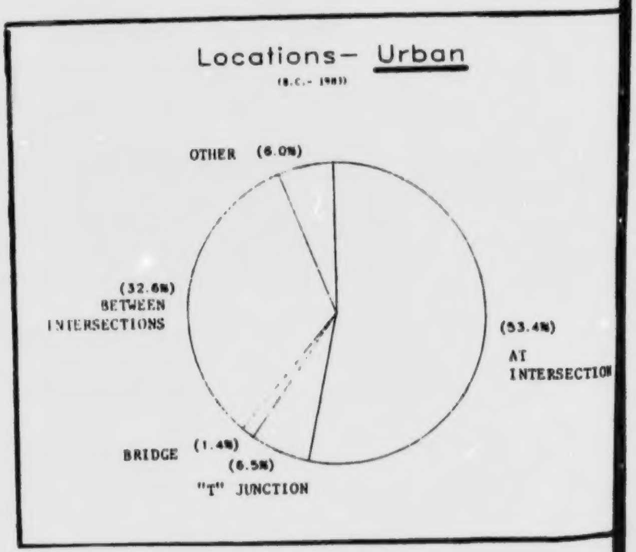


FIGURE 3

differ considerably if these accidents are roughly divided into those occurring in rural areas (29% of the total) and those occurring in municipal and urban areas (71% of the total). From Figures 2 and 3 it can be seen that intersection accidents comprise over half (53%) of the urban but only 19% of the rural numbers, while accidents between intersections account for 63% of the rural accidents and only 33% of the municipal accidents. Finally, comparing municipal and rural traffic accidents in terms of their occurrence at "T" junctions, bridges and "other" locations, the figures are: 6.5% vs 4.5%; 1.4% vs 3.6%; and 6.0% vs 10.3% respectively.

While Figures 2 and 3 examine the percentage breakdown of the locations of casualty traffic acidents within each of the urban and rural area classifications, Table 1 examines these locations between urban and rural areas. From this Table, it can be seen that 87% of the intersection accidents occur in urban areas, as do 55% of the "between intersection" accidents, 78% of the "T" junctions accidents, 51% of the "bridge" accidents and 58% of the "other" accidents.

Considering the above in terms of the potential dangerousness of various locations per road-mile, it can be reasonably argued that bridges are the most dangerous, as they are the location of 2.2% of all casualty traffic accidents, yet comprise substantially less than 2.2% of the millions of miles of roads in the province. Clearly, this is probably due to the relatively high density of traffic on bridges as compared to other locations. Nonetheless, this does mark them as specific police visibility and enforcement targets, as well as for strong signing and public education efforts.

Similarily, intersections can be seen as important locations for police and public education efforts. On the other hand, accidents per road mile between intersections are least dense, probably least predictable, and therefore least likely to be affected by police and education efforts.

Locations by Month, Day of Week and Time of Day

Tables 2, 3 and 4 show the breakdown of casualty traffic accident location by month, day of week and time of day respectively. Generally, these locations do not differ the one to the other along these variables. For example, the precentage of the intersection accidents that occur in any given month does not appear to be different from the percent of the "between intersection" accidents that occur in that same month. This also appears to be true for the day of week and the time of day analyses. It would seem that accidents in each of these locations increase and decrease at about the same rates, probably due to general changes in traffic density.

Locations by Accident Causes

Turning to the contributing factors assigned to traffic accidents by the attending police officers,[1] while the percent frequency of citing "Driving Without Due Care" changes little from location to location, the other contributing factors considered in this paper do vary considerably from accident location to accident location (see Table 5). For example, both intersection accidents and "T" junction accidents are high on the Failure to Yield Right of Way factor (33%, 25%) and relatively low on the Alcohol Involved factor (13%, 11%), while this pattern is reversed for

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[1] As accidents usually have more than one contributing factor, the percentages displayed in Table 5 can add to more than 100%.

TABLE 1
CASUALTY TRAFFIC ACCIDENT LOCATION BY URBAN/RURAL AREA
BRITISH COLUMBIA, 1983

Location	Total # Accidents	Rural (%)	Urban (%)
At Intersection	9,749	13	87
Between Intersections	9,403	45	55
"T" Junction	1,336	22	78
Bridge	498	49	51
Other	1,642	32	58
Provincial Total	22,628	29.4%	70.5%

TABLE 2
CASUALTY TRAFFIC ACCIDENT LOCATION BY MONTH OF YEAR
BRITISH COLUMBIA, 1983

	MONTH (%)												
Location	Total # Accidents	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
At Intersection	9,754	8	8	8	8	9	9	9	8	9	9	10	7
Between Intersections	9,434	7	7	7	8	9	9	9	9	8	9	9	9
"T" Junction	1,336	6	7	7	9	10	10	10	9	8	8	9	8
Bridge	500	6	7	6	6	7	7	7	10	9	11	12	10
Other	1,645	8	7	7	7	10	10	10	9	9	8	8	8
Provincial Total	22,669	7.2%	7.3%	7.3%	7.8%	8.7%	9.3%	9.1%	8.7%	8.5%	8.8%	9.3%	8.1%

TABLE 3
CASUALTY TRAFFIC ACCIDENT LOCATION BY DAY OF WEEK
BRITISH COLUMBIA, 1983

	DAY OF WEEK (%)							
Location	Total # Accidents	Mon	Tue	Wed	Thurs	Fri	Sat	Sun
At Intersection	9,754	13	14	14	15	16	16	12
Between Intersections	9,434	12	12	12	14	16	19	15
"T" Junction	1,336	14	14	15	15	16	16	10
Bridge	500	13	15	11	15	14	20	13
Other	1,645	12	12	13	14	16	19	15
Provincial Total	22,669	12.5%	13.1%	13.2%	14.3%	16.2%	17.4%	13.3%

TABLE 4
CASUALTY TRAFFIC ACCIDENT LOCATION BY TIME OF DAY
BRITISH COLUMBIA, 1983

Location	Total # Accidents	Mid-2 am	2 am-4 am	4 am-6 am	6 am-8 am	8 am-10 am	10 am-Noon	Noon-2 pm	2 pm-4 pm	4 pm-6 pm	6 pm-8 pm	8 pm-10 pm	10pm-Mid
At Intersection	9,681	5	4	1	4	7	9	12	15	16	12	8	7
Between Intersections	9,315	9	6	3	5	7	7	9	12	13	11	9	9
"T" Junction	1,325	5	3	1	3	7	10	12	17	19	11	7	6
Bridge	496	8	5	4	8	8	9	8	10	15	13	6	8
Other	1,615	7	9	5	4	6	9	9	13	11	11	9	7
Provincial Total	22,432	6.7%	5.1%	2.3%	4.6%	7.0%	8.3%	10.3%	13.6%	14.8%	11.5%	8.3%	7.5%

accidents occurring between intersections, at bridges, and in "other" locations. Further, accidents occurring on bridges are higher on the Weather and Tailgating factors than any other accident locations. Finally, Vehicle Fault accidents tend to occur least often at intersections.

TABLE 5
CASUALTY TRAFFIC ACCIDENT LOCATION BY COMMON CONTRIBUTING FACTORS
BRITISH COLUMBIA, 1983

	FACTORS (%)							
Location	Total # Accidents	Driving Without Due Care	Alcohol Involved	Speeding	Failure to Yield Right of Way	Weather	Tail-gating	Vehicle Fault
At Intersection	9,679	28	13	11	33	8	9	3
Between Inter-sections	9,400	33	24	21	3	13	6	5
"T" Junction	1,330	31	11	14	25	7	8	5
Bridge	495	29	20	21	2	20	15	6
Other	1,633	32	21	21	5	12	5	7
Provincial Total	22,537	30.4%	17.8%	15.8%	17.5%	10.5%	7.4%	4.4%

DISCUSSION

It is clear from the above analyses that the characteristics of rural casualty traffic accidents differ markedly from those of more urban accidents, with the former occurring primarily between intersections and the latter at intersections. Considering accident locations and causes, intersection accidents and those occurring at "T" junctions are most often caused by Failure to Yield the Right of Way and Driving Without Due Care, while those those at all other locations are caused primarily by Driving Without Due Care, with Speeding and Alcohol as secondary causes, both being cited at about the same frequency. Finally, accidents on bridges show a higher citation frequency for Tailgating and Weather as causal factors than do other locations.

Turning to locations by time of day, day of week, and month of year, the accident locations examined do not differ sytematically across these dimensions.

Before dealing with the law enforcement and public education implications of these findings it might be useful to state the obvious: Enforcement is easier and more effective if the target offence occurs at a specific locations at a known time, as opposed to a more general location at more general times. Education will be more successful and subsequent behaviour changes will be more likely if one is dealing with specific, definable behaviours that are not tied into a "lifestyle" and are not socially supported than if one is dealing with more general behaviours that are "lifestyle" linked and are socially supported.

It follows from this that accidents at intersections (which comprise the plurality of all casualty accidents in B.C. - 43%) and their primary cause - Failure to Yield the Right of Way - are most likely to be able to be substantially reduced by enforcement and public education efforts.

These accidents occur at known locations, at times of high traffic flow, and are primarily due to a specific driving behaviour. On the other hand, accidents between intersections, while occurring almost as often as those at intersections, do not regularly happen at the same place and are due to more "lifestyle" and socially supported behaviours like drinking and driving over the speed limit. Therefore these accidents and their causes are least likely to be reduced with the same enforcement and education efforts that would probably reduce intersection accidents and their causes.

Casualty traffic accidents at bridges comprise a small (2.2%) but significant proportion of all casualty traffic accidents, and because they are tied to specific and known locations, could probably be reduced through increased enforcement, better signing and the like. However, except for the causal factor of Tailgating, bridge accidents are closely linked to the more general and "lifestyle" factors of alcohol and speeding, and therefore are less able to be reduced by public education than are intersection accidents.

In sum, the two types of locations that produce the largest numbers of casualty traffic accidents are at intersections (43%) and between intersections (42%). The former are more urban phenomena, and are most often caused by Failure to Yield The Right of Way, while the latter are more rural and are caused by Driving Without Due Care, Alcohol Involvement, and Speeding, in that order. Because intersection accidents occur at known locations and occur because of specific driving behaviours that are not linked to "lifestyle", they can probably be more easily reduced through law enforcement and public information efforts than can "between intersection" accidents, which occur at more locations and are caused by the "lifestyle" and somewhat socially accepted behaviours of drinking and driving above the speed limit.

Casualty Traffic Accidents in Vancouver City Victoria and North Vancouver, 1983

CASUALTY TRAFFIC ACCIDENTS IN VANCOUVER CITY, VICTORIA AND NORTH VANCOUVER 1983

The purpose of this paper is to provide a brief overview of some of the major characteristics of casualty traffic accidents in Vancouver City, as taken from 1983 Traffic Accident Report Forms (MV104) completed by police at the time of these accidents. In order to put these characteristics in context, the roughly comparable areas of Victoria City and North Vancouver were also examined.

As can be seen from Table 1, 99.1% of casualty traffic accidents in these locations result in injury only, although it should be noted that in cost to society an injury accident is roughly as expensive as is one producing death.

Table 2 shows that 60% of the Vancouver City casualty accidents involve other motor vehicles, and that this is followed by pedestrian accidents at 21% (see also Appendix A in this paper), bicycle accidents at 8% and motorcycle accidents at 5%. Further, this table illustrates that pedestrian accidents comprise a substantially higher proportion of casualty accidents in Vancouver City than in the other two urban areas.

Table 3 demonstrates that the majority (about 63%) of casualty traffic accidents in all three locations occur at intersections.

Finally, Table 4 compares the three locations in terms of commonly cited contributing factors to these casualty traffic accidents. In Vancouver City, Failure to Yield Right of Way is the most commonly cited contributor (28%), followed by Driving Without Due Care (22%), Alcohol Involvement (13%), Speeding (8%), Weather (8%), Following Too Closely (4%), and Vehicle Fault (2%).

Comparing Vancouver City with the other two urban areas: it is lower in the contributing factor categories of Driving Without Due Care and Following Too Closely; about the same in terms of Alcohol Involvement, Speeding and Weather; and similar to one of the two others in terms of Failure to Yield Right of Way and Vehicle Fault.

In sum, in 1983 generally, casualty traffic accidents in Vancouver might be characterized as primarily injury accidents, involving other motor vehicles at intersections due to careless driving and failure to yield the right of way. Further, Vancouver City does not appear to differ radically from other comparable urban areas, with the noteworthy exception of a higher proportion of pedestrian accidents.

TABLE 1

Injury Only VS Death in Casualty Traffic Accidents in Vancouver City, Victoria City and North Vancouver 1983

Place	Total # Casualty Accidents	Injury Only	Death
Vancouver City	3,186	99.1%	0.9%
Victoria City	691	99.7%	0.3%
N. Vancouver R.C.M.P.	243	98.8%	1.2%

TABLE 2

Primary Collision Types of Casualty Traffic Accidents in Vancouver City, Victoria City and North Vancouver 1983

Place	Other Motor Vehicle	Motorcycle	Pedestrian	Bicycle
Vancouver City	60%	5%	21%	8%
Victoria City	55%	5%	13%	15%
N. Vancouver R.C.M.P.	66%	6%	15%	8%

TABLE 3

Primary Collision Locations of Casualty Traffic Accidents in Vancouver City, Victoria City and North Vancouver 1983

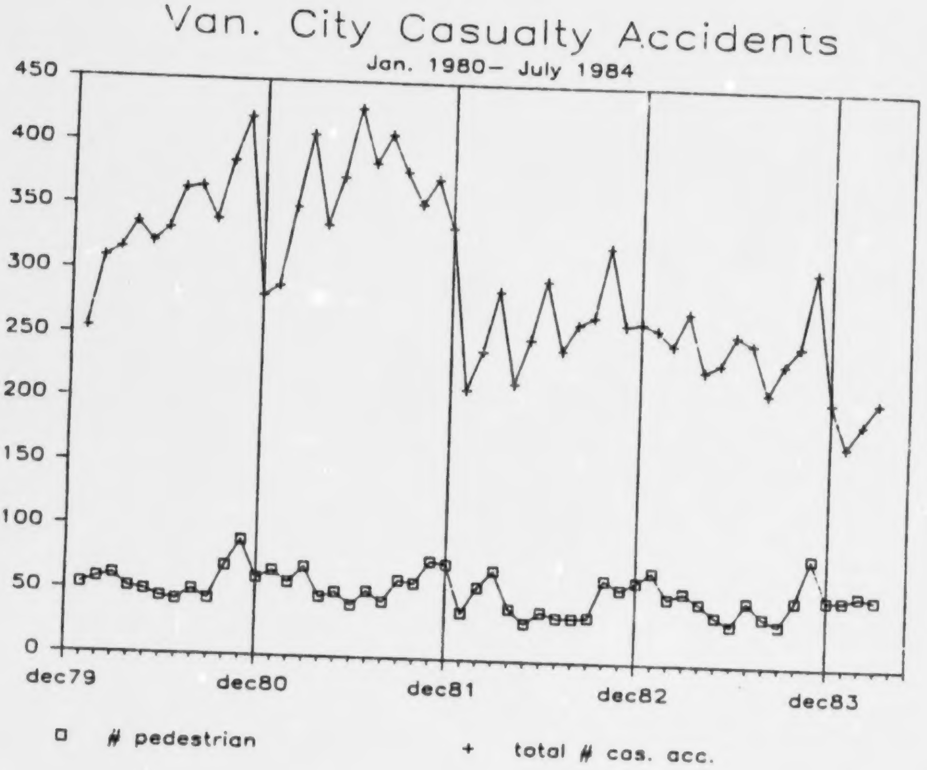
Place	At Intersections	Between Intersections	"T" Junctions
Vancouver City	62%	29%	4%
Victoria City	63%	27%	5%
N. Vancouver R.C.M.P.	63%	29%	6%

TABLE 4

Selected Contributing Factors to Casualty Traffic Accidents in Vancouver City, Victoria City and North Vancouver 1983

Place	W/O Care	Alcohol Invol	Speeding	Fail to Yield	Weather	Tailgate	Vehicle Fault
Vancouver City	22%	13%	8%	28%	8%	4%	2%
Victoria City	26%	15%	10%	21%	7%	10%	4%
N. Vancouver R.C.M.P.	41%	10%	8%	31%	10%	12%	2%

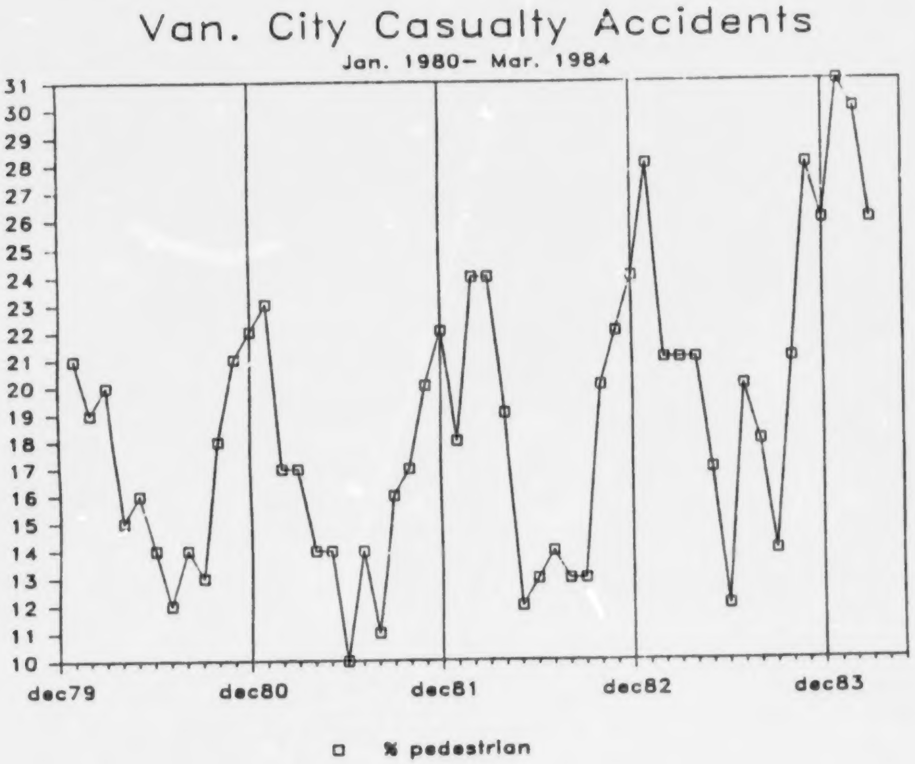
APPENDIX A

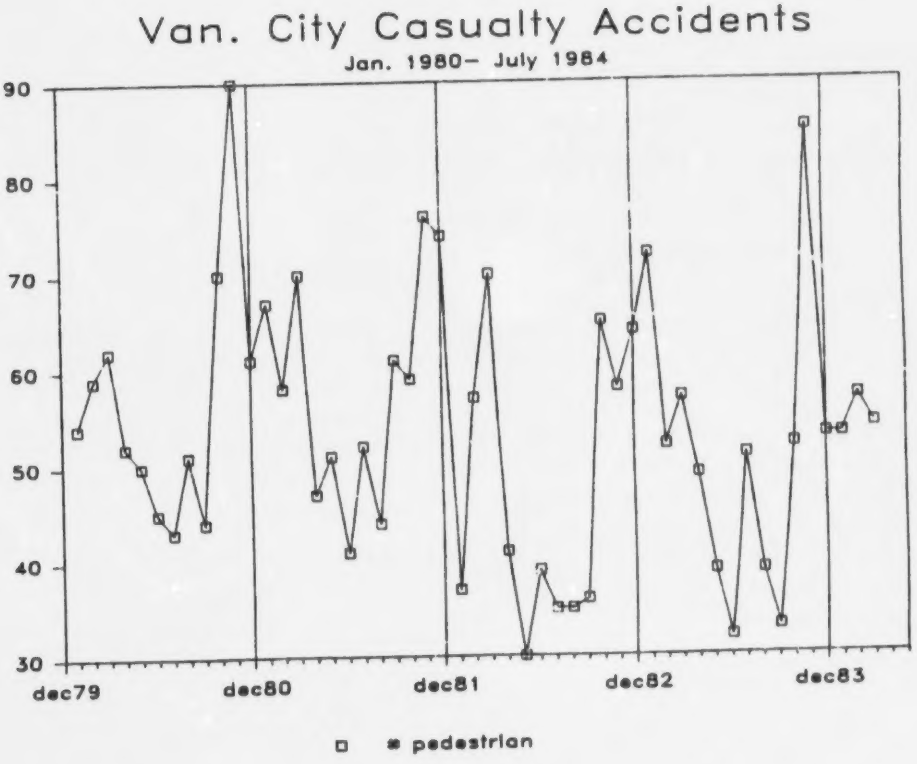


FIRST QUARTER OF 1984- % CASUALTY ACCIDENTS INVOLVING PEDESTRIANS

VANCOUVER CITY	29%
NORTH VANCOUVER	28%
VICTORIA CITY	15%
PROVINCIAL TOTAL	12.5%

The percentage rise in casualty accidents involving pedestrians in Vancouver over the last few months stems from the total number of these sorts of accidents remaining constant while other types of casualty traffic accidents have been decreasing. One might speculate that while the economy may be reducing the number of vehicles on the road, the number of pedestrians is either constant or increasing, thus producing the above relationship.


Van. City Casualty Accidents
Jan. 1980– Mar. 1984
31
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
dec79
dec80
dec81
dec82
dec83
% pedestrian


Van. City Casualty Accidents
Jan. 1980– July 1984
90
80
70
60
50
40
30
dec79
dec80
dec81
dec82
dec83
# pedestrian

Casualty Traffic Accident Causes by Police Reporting Area, British Columbia 1983

ACCIDENT CAUSES by POLICE REPORTING AREA, 1983

This table consists of a breakdown of selected contributing factors to casualty traffic accidents (i.e. an accident where someone was injured or killed). In order to interpret the information in this table, four things need to be kept in mind: First, in most police detachments/departments, the actual number of casualty traffic accidents is very small, so that a difference of one or two accidents can produce a very large percentage figure. Such large percentages based on a small number of accidents should not be taken as indicating any sort of trend or stable condition. They are most probably entirely random variations from police jurisdiction to police jurisdiction. Second, the contributing factors should be considered in the light of the provincial figures, and these are presented on the first page of the table. Third, very often there is more than one contributing factor to a traffic accident, therefore these figures can add up to more than 100%. Finally, as these factors are derived from an examination of all factors contributing to the accident, the percentages in each factor category will be greater than had only the primary factor for only one driver been examined. This is a noteworthy point because factor #1 driver #1 data is also presented in this document.

CONTRIBUTING FACTORS TO CASUALTY MOTOR VEHICLE CRASHES IN BRITISH COLUMBIA

LOCATION	No. of Crashes	% Alcohol Rel'd	% Dr. Unsafe Speed	% Dr. w/o Due Care	% Fail to Yield	% Due to Weath.	% Fol. too Close	% Veh. Fault
BRITISH COLUMBIA - 1982	24,262	18.9	16.7	29.7	15.7	11.8	7.0	4.1
BRITISH COLUMBIA - 1983	22,911	17.8	15.8	30.3	17.3	10.5	7.3	4.4
AUTONOMOUS DETACHMENTS								
Burnaby	1403	13.4	13.3	35.0	25.4	8.6	9.8	3.2
Coquitlam Rural	48	8.3	8.3	8.3	6.3	6.3	4.2	2.1
Coquitlam Municipal	363	17.6	11.0	26.2	18.7	9.6	8.8	5.0
Port Coquitlam	158	21.5	12.7	34.8	15.2	13.3	9.5	3.2
North Vancouver City	242	9.9	8.3	41.7	31.4	9.5	12.4	2.1
North Vancouver District	291	14.4	15.5	39.2	22.3	14.4	17.9	4.8
Richmond Township	748	11.1	10.3	33.7	23.7	11.2	13.5	4.1
Surrey	1627	16.2	9.1	25.4	18.6	9.2	14.4	3.6
CHILLIWACK SUB-DIVISION								
Abbotsford Rural	1	0.0	0.0	100.0	0.0	100.0	0.0	0.0
Abbotsford Municipal	106	16.0	18.9	40.6	21.7	10.4	4.7	4.7
Agassiz	61	23.0	18.0	32.8	6.6	11.5	1.6	8.2
Boston Bar	38	7.9	15.8	36.8	2.6	21.1	5.3	10.5
Chilliwack Rural	38	23.7	15.8	18.4	5.3	10.5	2.6	7.9
Chilliwack Municipal	346	18.8	15.6	27.2	16.2	8.4	3.8	3.8
Chilliwack Township	2	100.0	50.0	0.0	0.0	0.0	0.0	0.0
Hope	127	16.5	33.1	39.4	5.5	15.0	1.6	8.7
Mission Rural	41	19.5	34.1	31.7	12.2	14.6	0.0	0.0
Mission Municipal	121	15.7	26.4	33.9	15.7	17.4	7.4	9.1
Sumas Freeway Patrol (Unit C)	113	22.1	15.0	42.5	7.1	11.5	0.9	11.5
COURTENAY SUB-DIVISION								
Alert Bay	8	75.0	50.0	37.5	0.0	0.0	0.0	0.0
Campbell River Rural	73	32.9	32.9	37.0	4.1	9.6	2.7	9.6
Campbell River Municipal	117	21.4	15.4	38.5	17.1	11.1	10.3	2.6
Comox Municipal	35	25.7	20.0	48.6	25.7	17.1	11.4	0.0
Courtenay Rural	180	25.0	30.0	37.8	6.7	6.1	3.3	7.8
Courtenay Municipal	92	18.5	10.9	39.1	17.4	5.4	4.3	7.6
Gold River	15	6.7	6.7	53.3	0.0	20.0	0.0	0.0
Parksville	174	20.1	23.6	48.3	13.2	7.5	5.2	5.2
Port Alberni Rural	80	25.0	38.8	41.3	1.3	16.3	2.5	2.5
Port Alberni Municipal	101	18.8	14.9	48.5	30.7	4.0	5.0	3.0
Port Alice	13	7.7	38.5	69.2	0.0	7.7	7.7	0.0
Port Hardy	39	30.8	33.3	23.1	5.1	15.4	0.0	7.7
Port McNeill	39	17.9	17.9	7.7	5.1	15.4	0.0	12.8
Powell River Rural	42	21.4	14.3	28.6	2.4	16.7	0.0	14.3
Powell River Municipal	62	16.1	19.4	29.0	17.7	6.5	4.8	4.8
Quadra Island	2	0.0	50.0	0.0	0.0	0.0	0.0	50.0
Sayward	23	17.4	30.4	30.4	0.0	26.1	0.0	4.3
Tahsis	17	29.4	11.8	23.5	0.0	37.5	5.9	5.9
Tofino	8	25.0	37.5	37.5	0.0	13.5	0.0	12.5
Ucluelet	37	35.1	40.5	54.1	2.7	40.0	5.4	10.8

CONTRIBUTING FACTORS TO CASUALTY MOTOR VEHICLE CRASHES IN BRITISH COLUMBIA (Continued)

LOCATION	No. of Crashes	% Alcohol Rel'd	% Dr. Unsafe Speed	% Dr. w/o Due Care	% Fail to Yield	% Due to Weath.	% Fol. too Close	% Veh. Fault
KAMLOOPS SUB-DIVISION								
Alexis Creek	22	50.0	40.9	45.5	0.0	9.1	0.0	9.1
Anahim Lake	9	22.2	11.1	22.2	0.0	0.0	0.0	22.2
Ashcroft	39	17.9	23.1	46.2	5.1	12.8	0.0	2.6
Barriere	32	28.1	21.9	43.8	3.1	3.1	0.0	9.4
Blue River	23	4.3	17.4	8.7	0.0	14.8	0.0	17.4
Chase	82	24.4	20.7	39.0	3.7	11.0	1.2	7.3
Clearwater	42	33.3	14.3	38.1	0.0	16.7	0.0	7.1
Clinton	49	18.4	26.5	28.6	4.1	18.4	4.1	4.1
100 Mile House	85	29.4	20.0	35.3	3.5	21.2	3.5	5.9
Kamloops Rural	83	26.5	27.7	48.2	2.4	4.8	0.0	2.4
Kamloops Municipal	476	20.2	14.5	49.6	22.3	6.1	9.0	5.0
Lillooet	53	34.0	24.5	15.1	7.5	3.8	0.0	11.3
Logan Lake	17	29.4	11.8	23.5	5.9	17.6	0.0	0.0
Lytton	44	25.0	29.5	50.0	0.0	4.5	2.3	11.4
Merritt Rural	65	20.0	41.5	46.2	3.1	10.8	1.5	6.2
Merritt Municipal	28	46.4	10.7	35.7	17.9	10.7	0.0	0.0
Spences Bridge	17	29.4	0.0	58.8	5.9	5.9	0.0	17.6
Valemont	39	15.4	15.4	35.9	0.0	23.1	0.0	7.7
Williams Lake Rural	145	24.8	22.1	24.1	2.8	13.8	0.7	6.2
Williams Lake Municipal	83	22.9	19.3	43.4	22.9	6.0	2.4	6.0
KELOWNA SUB-DIVISION								
Armstrong	55	27.3	21.8	61.8	7.3	12.7	7.3	3.6
Enderby	57	24.6	26.3	24.6	3.5	17.5	3.5	1.8
Falkland	26	26.9	19.2	38.5	3.8	11.5	3.8	11.5
Kelowna Rural	193	19.2	22.3	22.8	10.4	5.7	7.8	3.1
Kelowna Municipal	412	21.4	13.6	29.9	17.2	5.8	9.0	2.9
Keremeos	45	20.0	17.8	26.7	2.2	17.8	2.2	6.7
Lumby	45	35.6	37.8	22.2	2.2	22.2	2.2	4.4
Oliver	70	22.9	15.7	30.0	12.9	7.1	2.9	4.3
Osoyoos	38	15.8	13.2	23.7	5.3	0.0	5.3	7.9
Penticton Rural	87	18.4	27.6	33.3	1.1	27.6	1.1	1.1
Penticton Municipal	182	19.8	20.9	30.2	17.6	4.9	8.2	3.3
Princeton	100	18.0	28.0	33.0	3.0	11.0	4.0	9.0
Revelstoke	131	19.1	20.6	27.5	8.4	12.2	4.6	6.9
Salmon Arm Rural	38	23.7	23.7	34.2	5.3	26.3	2.6	0.0
Salmon Arm Municipal	104	18.3	17.3	26.9	21.2	13.5	10.6	5.8
Sicamous	41	19.5	34.1	22.0	9.8	12.2	2.4	4.9
Summerland Rural	5	60.0	60.0	20.0	0.0	20.0	0.0	0.0
Summerland Municipal	24	16.7	29.2	20.8	25.0	8.3	12.5	0.0
Vernon Rural	153	24.2	25.5	30.7	10.5	17.0	5.2	4.6
Vernon Municipal	178	19.1	18.5	30.9	23.6	6.2	11.8	5.1

CONTRIBUTING FACTORS TO CASUALTY MOTOR VEHICLE CRASHES IN BRITISH COLUMBIA (Continued)

LOCATION	No. of Crashes	% Alcohol Rel'd	% Dr. Unsafe Speed	% Dr. w/o Due Care	% Fail to Yield	% Due to Weath.	% Fol. too Close	% Veh. Fault
NELSON SUB-DIVISION								
Castlegar Rural	43	23.3	23.3	27.9	2.3	18.6	0.0	4.7
Castlegar Municipal	41	19.5	4.9	24.4	24.4	0.0	12.2	0.0
Cranbrook Rural	71	28.2	18.3	31.0	0.0	18.3	0.0	4.7
Cranbrook Municipal	60	20.0	13.3	25.0	40.0	13.3	1.7	1.7
Crescent Valley	37	35.1	16.2	24.3	5.4	10.8	0.0	8.1
Creston	75	25.3	18.7	12.0	1.3	16.0	2.7	13.3
Elkford	31	38.7	25.8	16.1	0.0	0.4	3.2	3.2
Fernie	62	24.2	21.0	32.3	6.5	12.9	3.2	3.2
Field	18	11.1	16.7	16.7	0.0	16.7	0.0	5.6
Fruitvale	22	22.7	27.3	27.3	18.2	18.2	0.0	9.1
Golden	91	11.0	25.3	35.2	6.6	29.7	1.1	8.8
Grand Forks	83	26.5	21.7	32.5	8.4	15.7	1.2	6.0
Invermere	37	37.8	29.7	37.8	10.8	2.7	2.7	2.7
Kaslo	15	40.0	33.3	33.3	0.0	13.3	0.0	20.0
Kimberley Rural	29	27.6	17.2	10.3	3.4	10.3	3.4	0.0
Kimberley Municipal	21	19.0	14.3	23.8	9.5	28.6	0.0	4.8
Midway	21	23.8	23.8	28.6	0.0	19.0	0.0	14.3
Nakusp	31	25.8	22.6	29.0	0.0	6.5	0.0	6.5
Nelson	54	24.1	24.1	24.1	1.9	16.7	1.9	1.9
New Denver	6	33.3	50.0	50.0	0.0	16.7	0.0	16.7
Radium	24	12.5	4.2	12.5	8.3	16.7	0.0	8.3
Rossland	22	13.6	13.6	27.3	4.5	27.3	0.0	4.5
Salmo	28	21.4	21.4	28.6	3.6	14.3	3.6	10.7
Sparwood	55	21.8	29.1	38.2	1.8	18.2	5.5	5.5
Trail Rural	22	18.2	18.2	36.4	0.0	18.2	0.0	9.1
Trail Municipal	39	15.4	20.5	30.8	10.3	12.8	5.1	0.0
PRINCE GEORGE SUB-DIVISION								
Burns Lake	37	29.7	29.7	35.1	8.1	16.2	2.7	5.4
Chetwynd	56	12.5	21.4	17.9	1.8	28.6	1.8	5.4
Dawson Creek Rural	88	15.9	21.6	28.4	5.7	15.9	1.1	8.0
Dawson Creek Municipal	65	29.2	18.5	32.3	23.1	1.5	3.1	3.1
Fort Nelson	71	8.5	32.4	29.6	5.6	23.9	0.0	4.2
Fort St. James	32	25.0	15.6	31.3	9.4	9.4	0.0	6.3
Fort St. John Rural	67	23.9	29.9	29.9	9.0	14.9	1.5	6.0
Fort St. John Municipal	56	14.3	5.4	12.5	44.6	5.4	5.4	3.6
Fraser Lake	26	34.6	19.2	38.5	7.7	30.8	0.0	0.0
Hudson Hope	5	0.0	40.0	0.0	0.0	0.0	0.0	20.0
Mackenzie Rural	20	15.0	20.0	10.0	0.0	20.0	0.0	15.0
Mackenzie Municipal	15	20.0	33.3	40.0	13.3	6.7	0.0	13.3
McBride	27	11.1	3.7	33.3	0.0	29.6	0.0	3.7
Prince George Rural	131	18.3	18.3	36.6	3.8	9.9	0.8	4.6
Prince George City	397	24.9	12.6	32.0	19.9	5.8	3.8	4.5
Quesnel Rural	141	15.6	28.4	37.6	5.7	17.7	2.1	5.0
Quesnel Municipal	77	23.4	19.5	33.8	19.5	11.7	13.0	3.9
Tumbler Ridge	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vanderhoof	67	19.4	26.9	38.8	6.0	14.9	9.0	6.0
Watson Lake, Teslin	11	9.1	36.4	9.1	0.0	0.0	0.0	9.1
Wells	7	42.9	57.1	42.9	0.0	28.6	0.0	0.0

CONTRIBUTING FACTORS TO CASUALTY MOTOR VEHICLE CRASHES IN BRITISH COLUMBIA (Continued)

LOCATION	No. of Crashes	% Alcohol Rel'd	% Dr. Unsafe Speed	% Dr. w/o Due Care	% Fail to Yield	% Due to Weath.	% Fol. too Close	% Veh. Fault
PRINCE RUPERT SUB-DIVISION								
Atlin	4	75.0	50.0	25.0	0.0	0.0	25.0	25.0
Bella Bella	1	100.0	0.0	100.0	0.0	0.0	0.0	0.0
Bella Coola	18	38.9	33.3	50.0	0.0	5.6	0.0	11.1
Cassiar	23	26.1	21.7	39.1	4.3	8.7	0.0	4.3
Dease Lake	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Granisle	9	11.1	22.2	22.2	0.0	11.1	0.0	0.0
Hazelton	49	14.3	10.2	8.2	4.1	24.5	2.0	8.2
Houston	58	25.9	27.6	25.9	6.9	6.9	3.4	3.4
Kitimat Rural	12	16.7	16.7	41.7	0.0	25.0	0.0	16.7
Kitimat Municipal	35	25.7	31.4	37.1	11.4	5.7	2.9	8.6
Masset	17	35.3	11.8	47.1	0.0	5.9	5.9	0.0
New Aiyansh	4	50.0	0.0	25.0	0.0	0.0	0.0	25.0
New Hazelton	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prince Rupert Rural	24	16.7	29.2	25.0	0.0	33.3	0.0	4.2
Prince Rupert City	93	23.7	19.4	29.0	18.3	8.6	4.3	5.4
Queen Charlotte	31	48.4	32.3	32.3	9.7	9.7	3.2	0.0
Smithers	73	19.2	27.4	37.0	9.6	8.2	4.1	2.7
Stewart	27	18.5	22.2	25.9	0.0	14.8	0.0	3.7
Telegraph Creek	22	18.2	9.1	13.6	0.0	22.7	0.0	18.2
Terrace Rural	68	25.0	35.3	30.9	5.9	20.6	1.5	2.9
Terrace Municipal	81	24.7	14.8	35.8	18.5	12.3	7.4	4.9
VANCOUVER SUB-DIVISION								
Gibsons	55	25.5	21.8	45.5	3.6	10.9	0.0	9.1
Langley City	149	15.4	12.8	21.5	26.8	5.4	9.4	4.0
Langley Township	337	20.5	24.3	34.7	19.9	12.2	8.3	2.7
Maple Ridge Rural	63	31.7	19.0	31.7	12.7	17.5	9.5	6.3
Maple Ridge Municipal	212	23.1	17.9	26.4	19.3	6.6	6.6	2.4
Pemberton	30	36.7	46.7	43.3	0.0	10.0	0.0	10.0
Sechelt	74	25.7	20.3	29.7	6.8	18.9	5.4	4.1
Squamish Rural	37	8.1	29.7	24.3	2.7	24.3	2.7	10.8
Squamish Municipal	62	25.8	27.4	33.9	11.3	9.7	4.8	4.8
University	60	13.3	30.0	41.7	25.0	20.0	8.3	1.7
Vancouver-Bowen Island	5	20.0	20.0	20.0	0.0	20.0	0.0	20.0
Whistler	34	17.6	35.3	32.4	5.9	20.6	0.0	0.0
White Rock	71	12.7	11.3	25.4	26.8	8.5	4.2	12.7
Deas Isle Freeway Patrol (Unit A)	150	13.3	20.0	40.0	2.7	12.0	31.3	5.3
Port Mann Freeway Patrol (Unit B)	284	12.7	16.2	34.2	1.8	15.1	23.2	9.2

CONTRIBUTING FACTORS TO CASUALTY MOTOR VEHICLE CRASHES IN BRITISH COLUMBIA (Continued)

LOCATION	No. of Crashes	% Alcohol Rel'd	% Dr. Unsafe Speed	% Dr. w/o Due Care	% Fail to Yield	% Due to Weath.	% Fol. too Close	% Veh. Fault
VICTORIA SUB-DIVISION								
Chemainus	47	27.2	29.8	14.9	4.3	19.1	0.0	4.3
Colwood	280	23.9	17.5	40.0	12.5	12.9	7.1	4.6
Duncan	149	26.8	20.8	44.3	17.4	10.1	6.0	5.4
Duncan - North Cowichan	109	17.4	29.4	38.5	7.3	13.8	4.6	3.7
Gabriola Island	17	11.8	23.5	29.4	0.0	11.8	0.0	0.0
Ganges	55	30.9	41.8	20.0	0.0	20.0	0.0	12.7
Ladysmith	67	22.4	11.9	29.9	13.4	13.4	6.0	4.5
Lake Cowichan	42	33.3	26.2	33.3	0.0	11.9	0.0	14.3
Nanaimo Rural	51	27.5	25.5	31.4	9.8	5.9	13.7	3.9
Nanaimo Municipal	410	12.9	16.3	26.1	16.8	8.5	13.4	4.9
Pender Island	13	23.1	46.2	0.0	0.0	0.0	0.0	7.7
Shawnigan Lake	69	14.5	18.8	33.3	7.2	11.6	1.4	10.1
Sidney Rural	16	18.8	25.0	18.8	18.8	6.3	12.5	0.0
Sidney Municipal	76	10.5	14.5	28.9	26.3	7.9	9.2	3.9
Sooke	82	26.8	20.7	43.9	3.7	17.1	6.1	4.9
INDEPENDENT POLICE FORCES								
Central Saanich Police	72	20.8	19.4	37.5	23.6	12.5	8.3	1.4
Delta Municipal Police	378	18.8	12.4	24.3	21.7	11.6	7.9	3.2
Esquimalt Police Department	93	23.7	12.9	46.2	22.6	7.5	9.7	6.5
Matsqui Police Service	396	13.4	14.4	27.5	24.5	10.6	6.8	3.5
Nelson City Police	42	28.6	21.4	33.3	33.3	0.0	7.1	2.4
New Westminster Police	436	14.4	8.7	23.2	20.0	10.3	8.3	3.7
Oak Bay Police Department	67	10.4	11.9	28.4	20.9	4.5	14.9	1.5
Port Moody Police Dept.	105	15.2	12.4	27.6	10.5	14.3	16.2	2.9
Saanich Police Department	541	15.0	13.3	30.7	19.8	11.1	9.8	5.0
Vancouver City Police	3162	12.7	7.9	21.5	27.8	7.9	4.0	2.0
Victoria City Police	683	14.8	9.5	25.8	20.9	5.6	9.8	3.8
West Vancouver Police Dept.	281	12.1	13.2	21.7	12.5	14.6	6.8	5.3
FEDERAL AGENCIES								
National Harbours Board Pol.	5	20.0	60.0	60.0	0.0	40.0	0.0	0.0
CNR Police	1	0.0	0.0	0.0	100.0	0.0	0.0	0.0
Military Police	12	50.0	33.3	41.7	8.3	0.0	8.3	0.0

DRINKING DRIVING ROADCHECK "BLITZES"

The Relationships Among Driving While Impaired Charges, Police Visibility,
and Alcohol-Related Casualty Traffic Accidents
British Columbia, December, 1977- December 1982

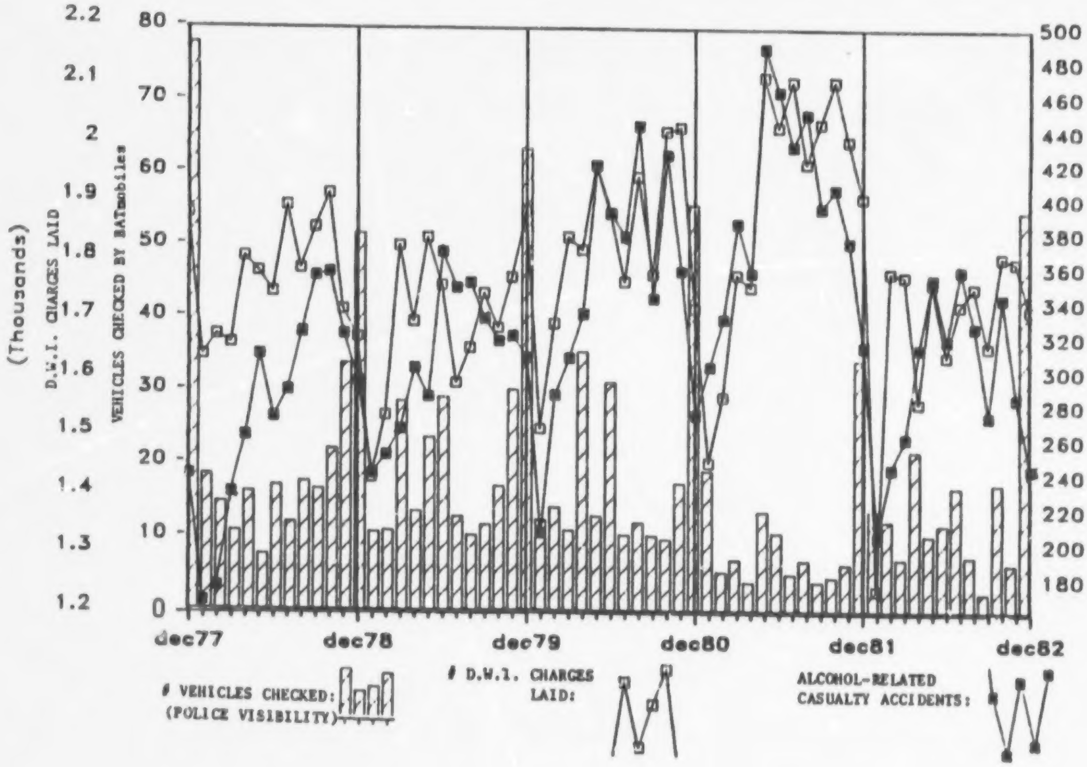
An Evaluation of the April- May 1984 Drinking Driving
Roadcheck, Enforcement, and Media "Blitz"

The Relationships Among Driving While Impaired Charges, Police Visibility, and Alcohol-Related Casualty Traffic Accidents British Columbia, December, 1977- December 1982

SUMMARY

A longitudinal examination of police visibility, alcohol-related casualty traffic accidents and Driving While Impaired (D.W.I.) charges found that: the frequency of D.W.I. charges related neither to a reduction of alcohol- related casualty traffic accidents nor to the frequency of police drinking- driving roadcheck activities as measured by vehicles checked by BATmobile teams. On the other hand, police visibility, as measured by BATmobile roadcheck activity, related significantly to a reduction of alcohol-related casualty traffic accidents in the month the checks were carried out and continued to be related to a reduction in these accidents in the following month. An explanation for these relationships is that the potential drinking driver's fear of apprehension is increased by the police presence and thus that driver does not drink and drive and consequently avoids alcohol-related accidents. Therefore, it is recommended that police resources should be directed toward high visibility roadcheck activities in order to reduce alcohol-related traffic casualties.

The relationships among D.W.I. charges, police visibility as measured by BATmobile vehicle checks and the number of alcohol-related casualty traffic accidents, B.C., 1977-82.



THE RELATIONSHIPS AMONG DRIVING WHILE IMPAIRED CHARGES, POLICE VISIBILITY, AND ALCOHOL-RELATED CASUALTY TRAFFIC ACCIDENTS, BRITISH COLUMBIA, DECEMBER 1977 - DECEMBER 1982

Arguably, it is better to prevent a crime than to apprehend the criminal after the crime has been committed. This homily is especially true with regard to Driving While Impaired (D.W.I.), as this crime results in thousands of injuries at a cost of over one hundred million dollars a year in British Columbia (Mercer, 1984).

One approach to reducing drinking driving and thereby reducing alcohol-related casualty accidents is to direct police resources toward a high rate of drinking driver apprehension and D.W.I. charges. Unfortunately, given current police resources, less than 2% of the impaired drivers on the road are apprehended (Mercer, 1983). In order to increase this proportion, the optimum police strategy would be to patrol late in the week and late at night when there is a high proportion of drinking drivers on the road and therefore there would be a good chance of apprehending same. For example, between 1:30 a.m. and 3:00 a.m. as many as 25% of the drivers have a Blood Alcohol Content (BAC) of over .05% (Mercer, 1982). Unfortunately, a high rate of D.W.I. charges brings with it substantial justice system costs and in any case does not seem to deter the drinking driver, as about 25% of those apprehended and charged with D.W.I. had been previously charge with the same offence (Mercer, 1983). Nonetheless, if a high charge rate can be show to reduce alcohol-related casualty accidents it would be worth the justice system expense, as a D.W.I. charge costs the justice system about $718, while a casualty accident costs at least $10,000 in insurance alone (Mercer, 1984).

A second approach to reducing drinking driving and the associated traffic casualties is to direct police resources toward a high level of visibility in the hope that a clearly visible police presence would deter the driver from drinking, as opposed to apprehending the driver after the fact. One strategy that could be used for this approach would be to mount roadchecks that are clearly associated with drinking driving concerns and make these roadchecks as visible as possible by locating them on major thoroughfares at times of high traffic flow, and by checking as many vehicles through these as possible. The notion here is that the potential drinking driver will perceive a heightened risk of apprehension and will therefore not drink and drive.

While the two approaches outlined above are not necessarily mutually exclusive, in an environment of very limited policing resources it is important to try to determine which of the two is most effecitve in reducing alcohol-related casualty accidents so that these scarce resources can be most effectively used. Consequently, it is the purpose of this paper to attempt to examine the effects of D.W.I. charges and police visibility on the frequency of alcohol-related casualty traffic accidents.

METHOD

The frequency of alcohol-related casualty traffic accidents in British Columbia between December 1977 and December 1982 was determined from an examination of Contributing Factor #1 for Driver #1 for each of the casualty accidents reported by the attending police officers on the Traffic Accident Report Form (MV104) for that time period. The numberod D.W.I. charges ws drawn from the Uniform Crime Report data supplied by the police to

Statistics Canada, while police visibility was measured by using the number of vehicles checked at roadblocks by police BATmobile teams (mobile blood alcohol testing vehicles). It should be noted that while BATmobile vehicle checks do not comprise all of the police drinking driver roadcheck activity, they can be seen as a reasonable indication of same. Further, as all 14 of the BATmobile vans are clearly marked with the CounterAttack anti-drinking driving logo, they probably effectively associate the roadblock with drinking driving in the minds of the drivers, thus increasing the potential drinking driver's fear of apprehension.

Analyses: The relationships among D.W.I. charges, police visibility as measured by vehicle checks, and the number of alcohol-related casualty accidents were examined graphically and through the use of Pearson's product-moment correlation coefficient (Pearson's r). Additionally, D.W.I. and vehicle check levels in each month were correlated with the number of alcohol- related casualty traffic accidents in each following month to determine if police activity in one month affected accident levels in the next month.

RESULTS

Between December 1977 and December 1982 there were an average of 323 alcohol-related casualty traffic accidents per month, 1,780 D.W.I. charges laid per month, and 18,360 vehicles checked by BATmobiles per month. However, from Table 1 and Figure 1, Figure 2 and Figure 3 it can be seen that these rates varied considerably from month to month. Generally, both D.W.I. charges and alcohol-related casualty traffic accidents were low in the December-January periods and high in the mid-year periods, while police

Table 1. Correlations among the number of alcohol-related casualty traffic accidents, the number of Driving While Impaired charges laid, and Police Visibility as measured by the number of vehicles checked in roadchecks by BATmobile teams, British Columbia, Dec. 1977- Dec. 1982.

VARIABLE	ACC (N=61)	DWI (N=61)	VEH (N=61)	ACC+1 (N=60)	MEAN	S.D.
Alcohol-Related Casualty Accidents (ACC)		.67 p=.00	-.26 p=.05	.72 p=.00	323	70
Driving While Impaired Charges (DWI)			.01 n.s.	.36 p=.01	1780	172
Vehicles Checked in Roadchecks (VEH)				-.43 p=.00	18360	15273
Alcohol-Related Casualty Accidents in following month (ACC+1)					324	70

FIGURE 1

The relationship between D.W.I. charges laid and the number of alcohol-related casualty traffic accidents, B.C., 1977-82.

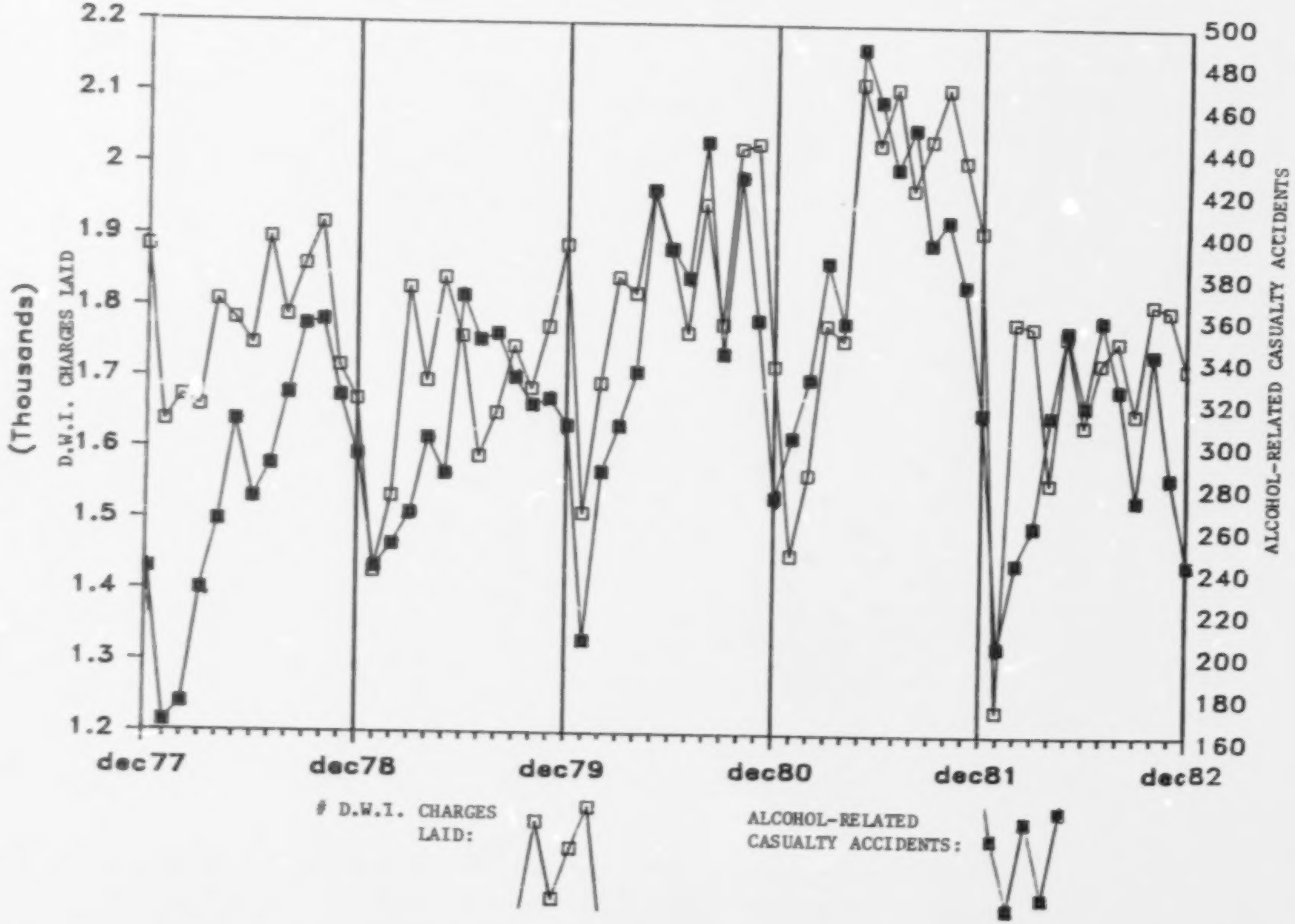


FIGURE 2

The relationship between police visibility as measured by BATmobile vehicle checks and the number of alcohol-related casualty traffic accidents, B.C., 1977-82.

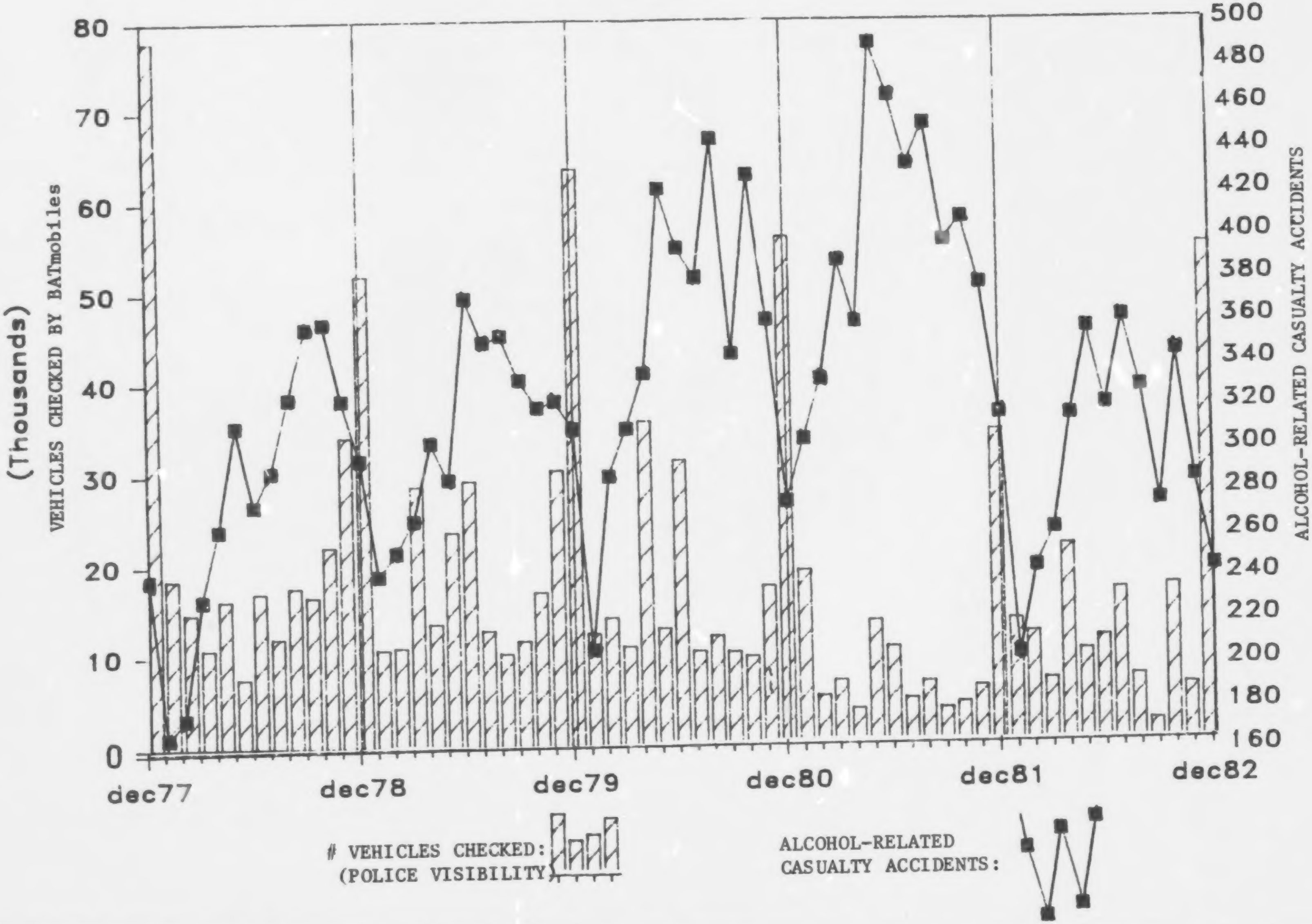
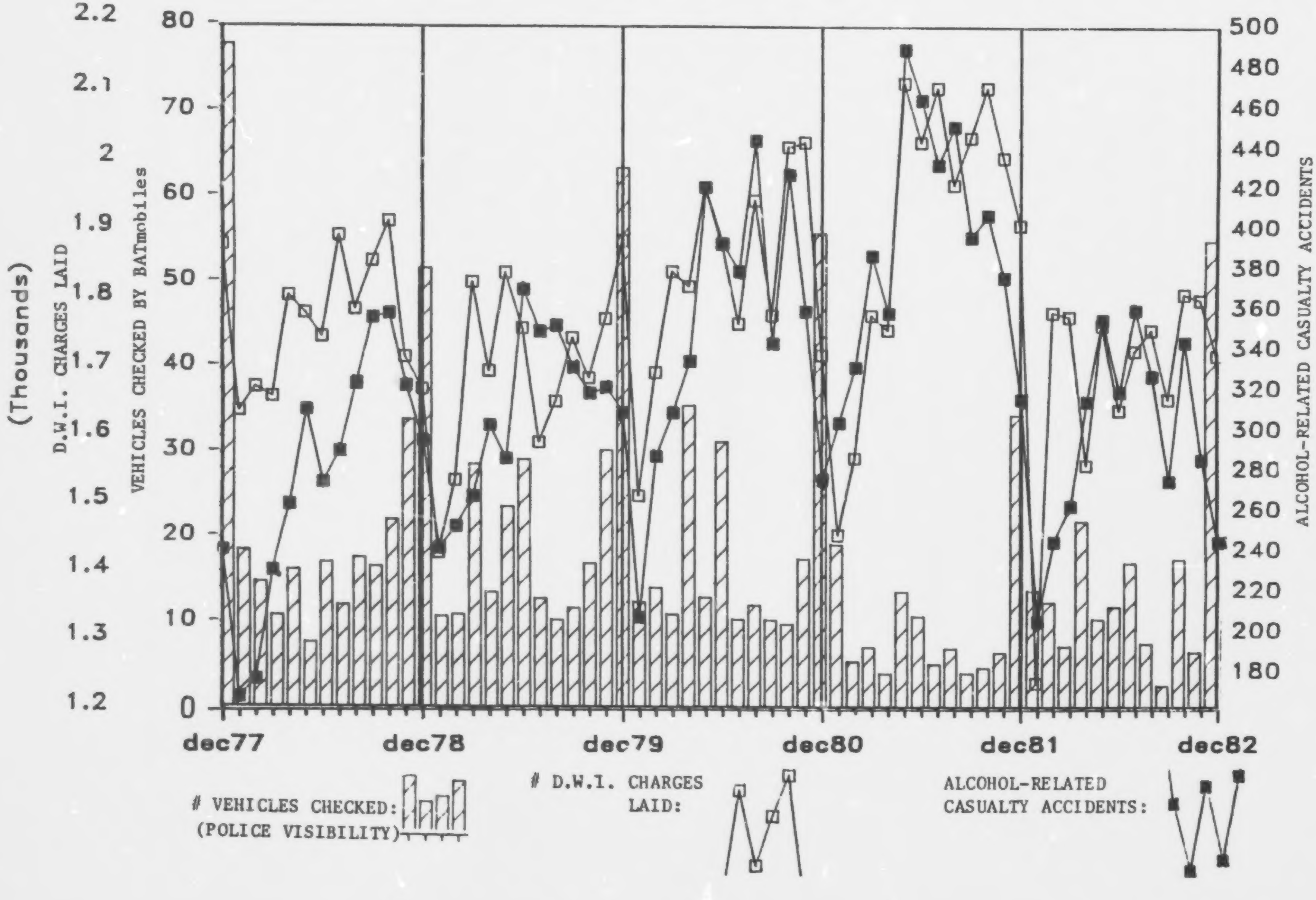


FIGURE 3

The relationships among D.W.I. charges, police visibility as measured by BATmobile vehicle checks and the number of alcohol-related casualty traffic accidents, B.C., 1977-82.



visibility is high in the low accident and charge times and was low in the high accident and charge times.

More specifically, the relationships in Table 1 show that D.W.I. charges are in no way related to a reduction in alcohol-related casualty traffic accidents but rather rise and fall with the rise and fall of these accident rates (see Figure 1). Further, D.W.I. charges are not in any particular way related to police BATmobile vehicle check activity. On the other hand, police visibility as measured by BATmobile vehicle checks is related to a reduction in alcohol-related casualty accidents in the month of the checks, and especially strongly related to a reduction in these accidents in the month following the checks (see Figure 2).

DISCUSSION

The results of this study show that:

1. The frequency of Driving While Impaired (D.W.I.) charges in no way related to a reduction of alcohol-related casualty traffic accidents.

2. The frequency of D.W.I. charges did not particularly relate to police drinking-driving roadcheck activities as measured by vehicles checked by BATmobile teams.

3. Police visibility as measured by BATmobile roadcheck activity related significantly to a recution of alcohol-related casualty traffic accidents in the month the checks were carried out and continued to be related to a reduction in these accidents in the following month.

The probable explanation for the reduction of alcohol-related casualty traffic accidents being related to increased police visibility is that the potential drinking driver's fear of apprehension is increased by the police presence and thus that driver does not drink and drive and consequently avoids alcohol-related accidents. However, it must be noted that a highly visible police presence is amplified by the media articles and anti-drinking driving messages that are timed to coincide with the roadcheck activities.

From these findings it is recommended that police resources should be directed toward high visibility roadcheck activities in order to reduce alcohol-related traffic casualties.

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Mercer, G. W.; Driving While Impaired: Drivers, Charges and Outcomes, Vancouver, B.C., Ministry of Attorney General, 1983.

Mercer, G. W.; Alcohol-Related Casualty Traffic Accidents in B.C., Ministry of Attorney General, 1984.

An Evaluation of the April- May 1984 Drinking Driving Roadcheck, Enforcement, and Media "Blitz"

SUMMARY

The April- May 1984 roadcheck, enforcement, and media drinking driving "blitz" co-ordinated by the Police Advisory Committee failed to reduce the number of alcohol-related casualty traffic accidents below levels that would have been expected had there been no blitz. The probable explanation for this is that, due to insufficient media coverage, possibly linked to a Lower Mainland area newspaper strike, the public was not aware of the blitz and therefore did not change their drinking driving behaviours.

AN EVALUATION OF THE APRIL-MAY 1984 DRINKING DRIVING ROADCHECK, ENFORCEMENT, AND MEDIA BLITZ

Many types of criminal offences vary systematically from hour to hour, from day of week to day of week, and from month to month. Driving while impaired by alcohol is one such criminal activity -- it tends to occur most frequently after 10 p.m., on Fridays and Saturdays, and in the Spring and Summer. Because of the predictable regularity of driving while impaired offences, this crime lends itself to varying rates of enforcement efforts, in terms of both pre-offence prevention and post-offence apprehension. In fact, the December-January drinking driving enforcement and media campaigns have reduced alcohol-related casualty traffic accidents during this period to the lowest rate in the year. Arguably, the public believes that they will be apprehended if they drink and drive during the Christmas-New Year period, and this belief prevents their drinking and driving, which in turn reduces the alcohol-related accident rate. That is,

INCREASED POLICE ACTIVITY
+
MEDIA AMPLIFICATION OF INCREASED POLICE ACTIVITY → INCREASED FEAR OF APPREHENSION → DECREASED DRINKING DRIVING → DECREASED ALCOHOL-RELATED TRAFFIC ACCIDENTS

Knowing that drinking driving accidents occur in a high proportion in the Spring, and having produced the very successful Christmas drinking driving roadcheck blitz programs, the police throughout British Columbia decided to try to reduce these accidents by mounting a province-wide four-week roadcheck, enforcement, and media blitz from April 20 to

May 21.[*] It is the purpose of this report to document this Easter blitz and to evaluate the success of same in terms of four areas:

I. Police activity concerning the blitz

II. Media activity concerning the blitz

III. The public's perceived likelihood of apprehension, awareness of the blitz, experience with roadchecks, and reported drinking driving before and after the blitz

IV. The rates of alcohol-related casualty traffic accidents before, during, and after the blitz

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[*] This activity was co-ordinated by the Police Advisory Committee (P.A.C.) which is made up of senior traffic officers representing all of the police groups and geographic regions of the province.

METHOD AND RESULTS

I. Police Activity

As can be seen from the graph on p. 126 and the tables in Appendix A, the police activity reported by the various police groups concerning the four-week Easter blitz was substantial and involved 13,290 person-hours with 265,455 vehicles stopped, 1,390 drinking driving charges laid, 2,641 24-hour suspensions, and 10,879 seat belt charges.

Considering the number of driving while impaired (D.W.I.) charges laid, a Box-Jenkins projection* indicated that no more or fewer D.W.I. charges were laid during the blitz than would probably have been laid had there been no blitz.

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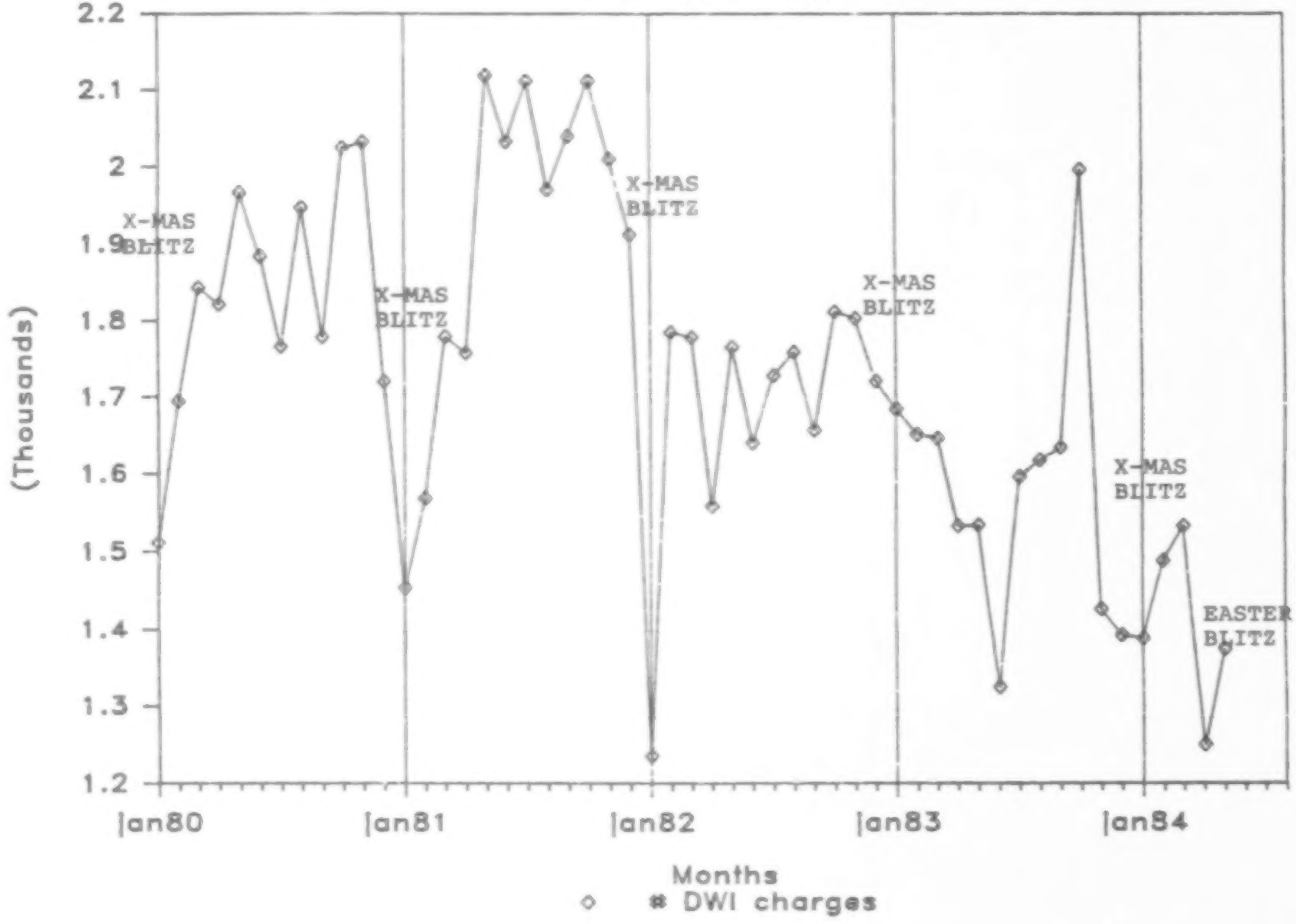
* This statistical test was based on monthly data commencing January 1978 with a 12-month period. The projected figure for April was 1,499 with a lower confidence limit of 1,176 and an upper limit of 1,822, while the projected figure for May was 1.586 with a lower limit of 1,236 and an upper limit of 1,935. The actual April and May figures were 1.250 and 1,373.

DWI Charges
B.C. 1980- 1984



II. Media Activity

The graph on p. 128 and the graphs and table in Appendix B show the rates of newspaper articles on driving while impaired in general and on the blitz in particular for the province as a whole as well as for eight geographic areas roughly corresponding to police reporting districts and subdivisions. While both the number and proportion of blitz articles vary widely from area to area, overall Western Press clipping service found 217 articles related to driving while impaired, with 50% specifically dealing with the blitz in April, while the figures for May were 178 and 34% respectively.

Unfortunately, the blitz occurred when the major Victoria and Vancouver newspapers were on strike, and this probably seriously reduced the public's awareness of the blitz in these areas. However, the province-wide airing of three 30-second radio messages advertising the blitz may have lessened the impact of the newspaper strike. In any case, the graph on p. 128 shows that, at least with regard to newspaper penetration, the frequency of articles dealing with drinking driving during the blitz period in no way approached the frequency of these articles during the previous Christmas blitz. Indeed, a Box-Jenkins projection* indicated that the number of these articles was within what would be expected had a blitz not occurred.

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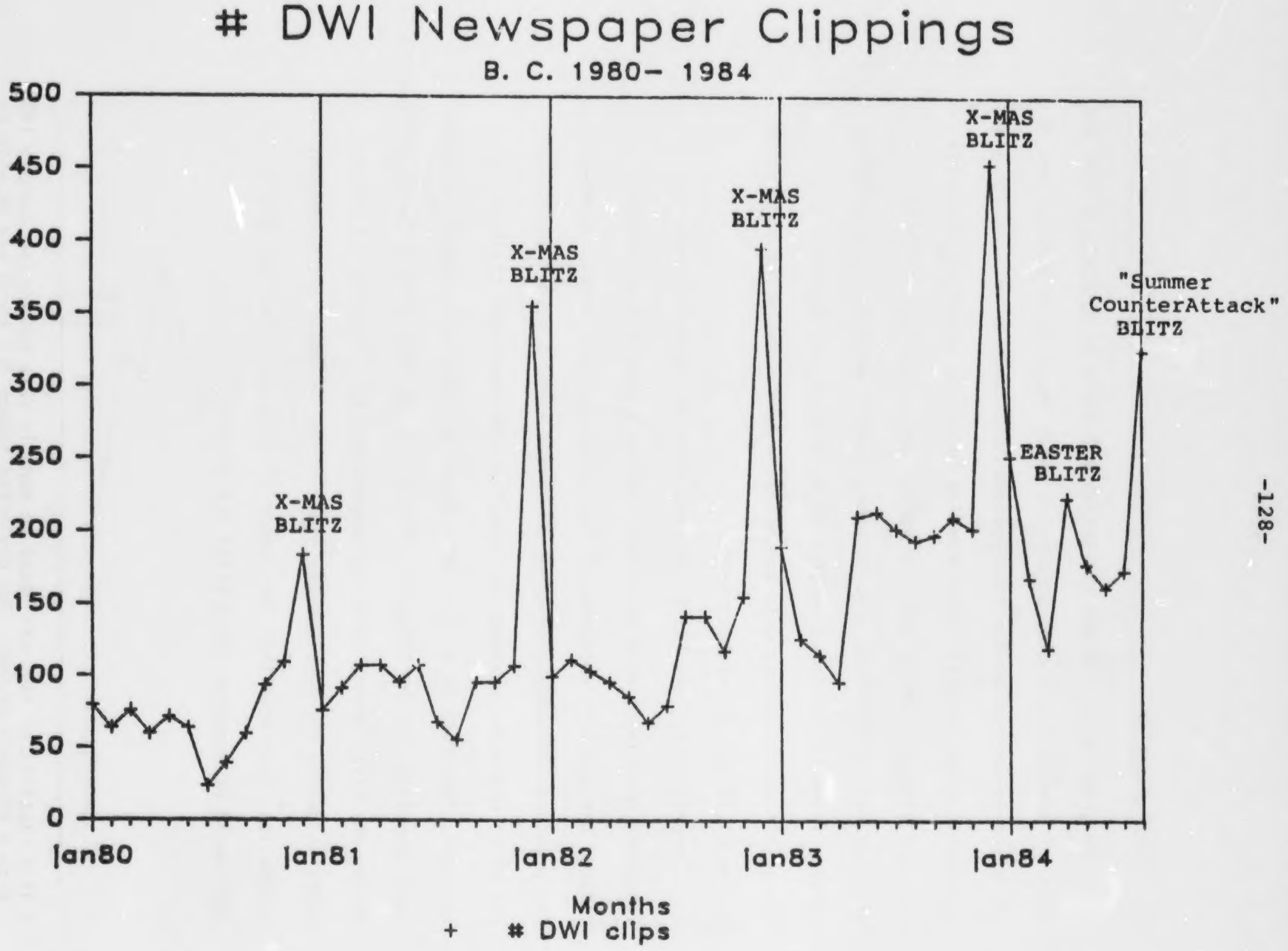
* This statistical test was based on monthly data commencing January 1980 with a 12-month period. The projected figure for April was 84 with an upper and lower confidence limit of 225 and 54, while the projected figure for May was 171 with an upper and lower confidence limit of 310 and 31 ($p = .05$). The actual April and May figures were 217 and 178.



# DWI Newspaper Clippings
B. C. 1980– 1984
500
450
400
350
300
250
200
150
100
50
0
X-MAS BLITZ
X-MAS BLITZ
X-MAS BLITZ
X-MAS BLITZ
EASTER BLITZ
"Summer CounterAttack" BLITZ
Jan80
Jan81
Jan82
Jan83
Jan84
Months
+ # DWI clips

III. Public Perceptions

The crucial element in an intensive enforcement and media campaign is that the public be made acutely aware that the enforcement of the laws surrounding the blitz topic is being substantially increased. As noted above, the notion is that this awareness of increased enforcement will increase the potential offender's perceived likelihood of apprehension, and therefore he or she will not commit the offence. In order to measure any changes in the public's perception of apprehension, as well as their awareness of the campaign, any changes in their reported drinking driving, and their experience with the blitz roadchecks, telephone surveys were taken in the week previous to and the week following the Easter blitz (see Appendix C for a copy of the interview questionnaire). Statistical tests (chi-square) were carried out to determine whether or not there were meaningful differences between the responses before and after the blitz, as well as if there were differences after the blitz between persons living in the Lower Mainland and Victoria area, where there was a strike of the major newspapers, and the rest of the province. In all, 249 persons were interviewed before the blitz and 252 after. The findings were as follows:

1. There was no difference either before and after the blitz or between the newspaper strike and no-strike areas in terms of perceived likelihood of apprehension. That is, those interviewed did not rate the likelihood of being stopped for drinking driving any differently before the blitz as after, and did not rate it differently in the strike vs. no strike areas.
2. In response to the question "can you name any groups or organizations that have been campaigning against drinking driving?", the public did not seem to be aware that a blitz was on. They did not mention the groups participating in the blitz (i.e., the Police, CounterAttack, I.C.B.C.) more often after the blitz than before, or more often in the no newspaper strike area than in the newspaper strike area. Overall, I.C.B.C. was mentioned by 1% of the respondents, CounterAttack by 5%, and the Police by 12%, while 35% said that they did not know of any

groups campaigning against drinking driving.

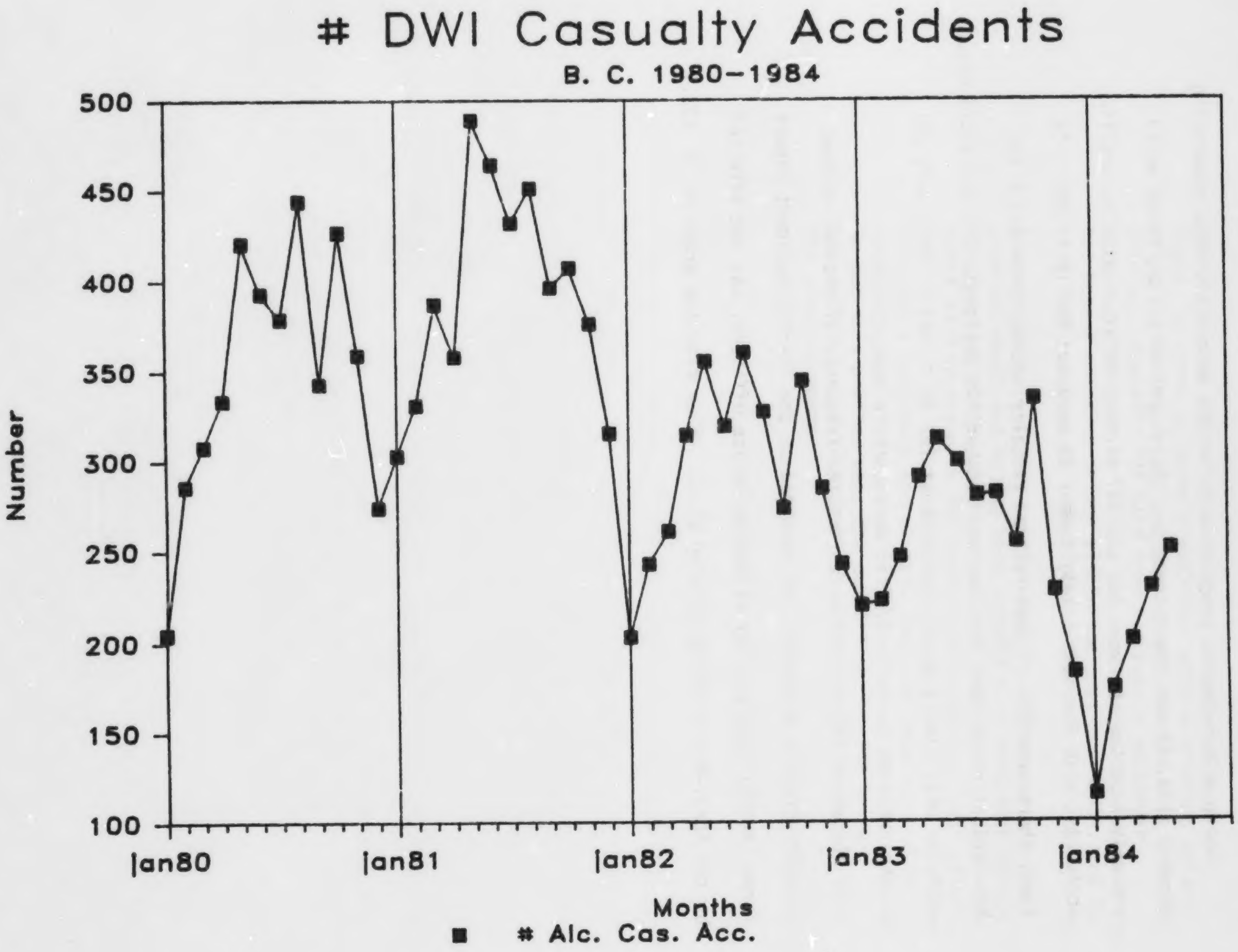
3. Using the same comparisons as above, no differences were found in terms of being a passenger with a drinking driver, being a drinking driver, or having been charged with drinking driving. Overall, 19% said they had been a passenger with a drinking driver within the previous month, 15% said they had been a drinking driver within the previous month, and 5% said they had been at some time charged with drinking driving.

4. However, with regard to having seen a roadcheck within the previous month and having been stopped at a roadcheck within the previous month, there was a large and statistically significant increase in the proportion answering "yes" after the "blitz". To illustrate, before the "blitz" 17% said they had seen a roadcheck and 6% said they had been stopped in a roadcheck, while after the blitz the figures were 38% and 12%. To put this another way, the numbers seeing and being stopped in a roadcheck doubled during the "blitz" month from the previous month.

IV. Alcohol-Related Traffic Accidents

Using a Box-Jenkins projection technique on monthly data commencing January 1978, it was found that, had there been no blitz, there would probably have been between 203 and 357 alcohol-related casualty traffic accidents, with the most likely number to be about 280 ($p = .05$). In fact, there were 251 alcohol-related casualty accidents in May. The Box-Jenkins projection for June was between 179 accidents and 345 accidents, with the most likely number to be about 262 ($p = .05$). There were 251 alcohol-related casualty traffic accidents in June.

The above figures indicate that the frequency of alcohol-related casualty traffic accidents, as recorded on the Traffic Accident Report Forms (MV104) completed by attending police officers, was not affected by the April-May drinking driving blitz. (See also the graph on p. 132.)

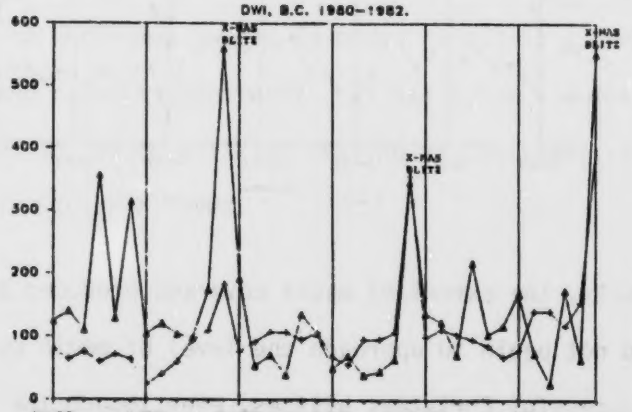

# DWI Casualty Accidents
B. C. 1980–1984
Number
500
450
400
350
300
250
200
150
100
Jan80
Jan81
Jan82
Jan83
Jan84
Months
■ # Alc. Cas. Acc.

DISCUSSION AND CONCLUSIONS

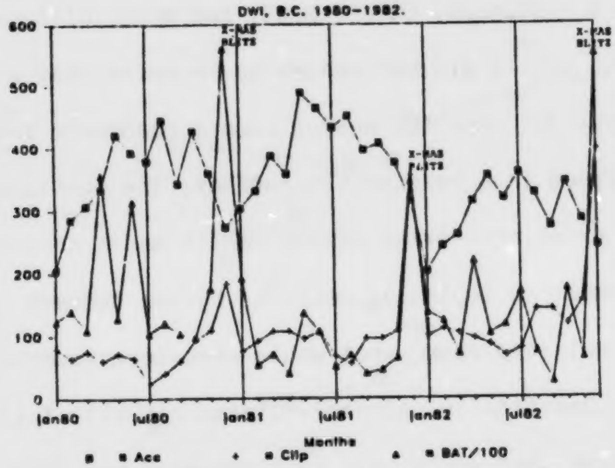
The above analyses indicate that the April 20 to May 21 1984 drinking driving roadcheck, enforcement, and media blitz was not successful: the public did not appear to be aware that a blitz was on, even though about 38% reported having seen a roadcheck and 12% reported having been stopped in a roadcheck. Further, the public did not appear to alter their drinking driving habits, while media coverage of driving while impaired topics as measured by the numbers of newspaper clippings did not rise above what would have been expected had there been no blitz. And finally, alcohol-related casualty traffic accidents did not drop below what would have been expected had there been no blitz.

The immediate question that comes to mind is: how could a month-long blitz that took up 13,290 police hours and stopped 265,455 vehicles have failed to reduce drinking driving? Before dealing with this particular question, a number of points need to be made.

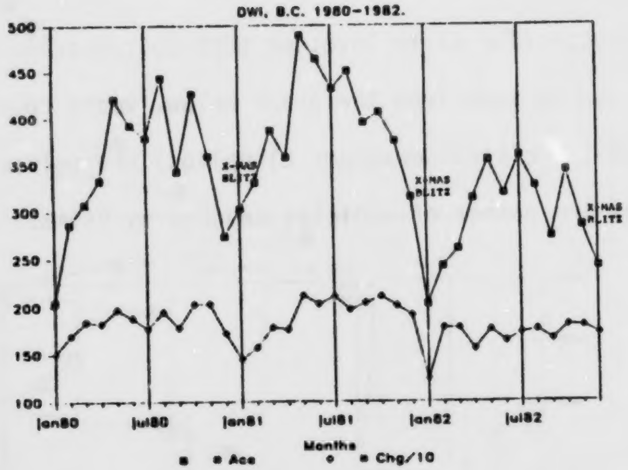
First, a successful blitz involves both police activity and media coverage. As can be seen from the graph below, media coverage (as measured by D.W.I.-related newspaper clippings) and police activity (as measured by the number of vehicles checked by BATmobiles) tend to go hand in hand.



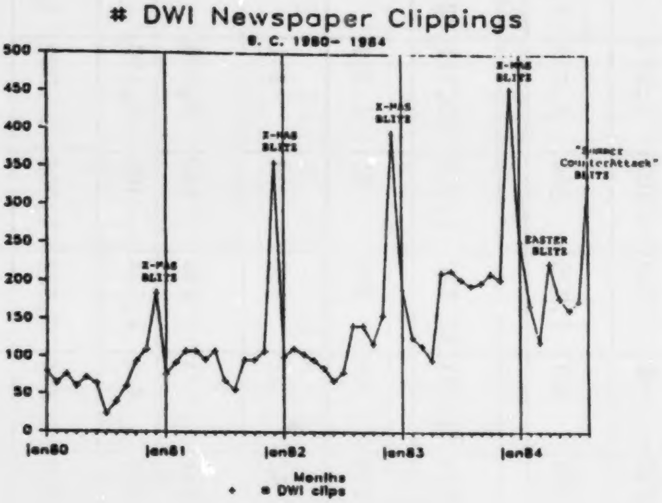
Second, these two influences together substantially reduce alcohol-related casualty accidents, as shown below.



Third, D.W.I. charges and D.W.I. casualty accidents tend to rise and fall together, both probably reflecting the frequency of drinking driving.



Finally, the extent of media coverage produced by the April-May blitz did not begin to approach the level of media coverage experienced in the successful Christmas blitzes, even though the number of vehicles stopped and the number of D.W.I. charges laid were at least comparable to the Christmas levels. (See also Appendix D for a statistical analysis of these relationships.)



Clearly, the missing element in the April-May drinking driving blitz was sufficient media coverage. It is not enough that the public only see roadchecks -- in British Columbia the public ought to be relatively familiar with them. What is necessary is that the public know that there is a blitz on. Without this crucial piece of information, the blitz roadcheck becomes just another roadcheck.

Finally, it may not be enough to raise both the media coverage and police activity to Christmas levels in order to attain a comparable drop in alcohol-related casualty accidents. It has taken a number of years of Christmas blitzes to reduce drinking driving at Christmas, and the same may hold true for Easter blitzes.

APRIL- MAY 1984 P.A.C. BLITZ: ALL POLICE REPORTED DATA SUMMARY

DATA TYPE	R.C.M.P. SUBDIVISIONS								RCMP TOTALS	INDEP. DET. TOTALS	PROV. TOTALS
	COURT-ENAY	KELOWNA	KAM-LOOPS	NELSON	PRINCE GEORGE	PRINCE RUPERT	DIST. #1	VIC-TORIA			
A. # FATAL COLLISIONS	0	3	5	2	5	3	4	3	25	4	29
B. # PERSONS KILLED	0	3	5	2	6	4	4	3	27	5	32
C. # INJURY COLLISIONS	79	109	87	62	93	31	496	73	1,030	386	1,416
D. # PERSONS INJURED	110	154	147	92	138	48	729	103	1,521	486	2,007
E. # PROPERTY DAMAGE ONLY COLLISIONS	226	593	329	240	305	121	1,925	294	4,033	2,387	6,420
F. TOTAL CHARGES (EXCLUDES G & M)	2,595	5,029	3,204	4,163	4,433	1,251	22,372	2,464	45,511	22,875	68,386
G. # PERSONS CHARGED DWI	90	176	86	129	185	56	386	81	1,189	201	1,390
H. # COLLISIONS INVOLVING ALCOHOL	34	53	40	37	42	22	180	33	441	112	553
I. # 214 M.V.A. SUSPENSIONS NOT INCLUDING THOSE UNDER G	191	268	159	126	251	71	782	160	2,008	633	2,641
J. # ROAD CHECK HOURS	340	434	513	697	588	426	1,784	408	5,190	243	5,433
K. # PERSON HOURS ON ROAD CHECKS (J. x # PEOPLE)	681	1,536	1,603	1,751	1,085	694	3,621	1,006	12,009	1,281	13,290
L. # VEHICLES CHECKED (ROAD CHECKS ONLY)	17,006	20,209	11,029	31,429	17,947	5,395	85,198	21,828	210,068	55,387	265,455
M. # SEAT BELT CHARGES	739	659	464	1,103	708	420	3,673	965	8,731	2,148	10,879
N. # NEWSPAPER ARTICLES MENTIONING DRINKING DRIVING*	20	30	9	29	45	25	54	27	239	27	266

* AND/OR SEAT BELTS

APRIL- MAY 1984 P.A.C. BLITZ: INDEPENDENT POLICE REPORTED DATA SUMMARY

	VANCOUVER AREA INDEPENDENTS							VICTORIA AREA INDEPENDENTS						NELSON INDEP.	INDEP. TOTAL
DATA TYPE	DELTA	MATSQUI	NEW WEST.	PORT MOODY	VAN. CITY	WEST VAN.	TOTAL	VIC.	SAAN.	CEN. SAAN.	ESQUI.	OAK BAY	TOTAL		
A. # FATAL COLLISIONS	0	0	0		4		4	0		0	0		0	0	4
B. # PERSONS KILLED	0	0	0		5		5	0		0	0		0	0	5
C. # INJURY COLLISIONS	34	25	39		217		315	59		1	9		69	2	386
D. # PERSONS INJURED	46	38	46		273		403	67		2	12		81	2	486
E. # PROPERTY DAMAGE ONLY COLLISIONS	172	110	172		1,688		2,142	200		15	5		220	25	2,387
F. TOTAL CHARGES (EXCLUDES G & M)	33	1,005	22		19,255		20,315	2,274		69	209		2,552	8	22,875
G. # PERSONS CHARGED DWI	6	13	13		151		183	7		3	2		12	6	201
H. # COLLISIONS INVOLVING ALCOHOL	25	5	11		51		92	14		2	3		19	1	112
I. # 214 M.V.A. SUSPENSIONS NOT INCLUDING THOSE UNDER G	13	112	70		300		495	68	7	7	46		128	10	633
J. # ROAD CHECK HOURS	12	49	22		27		110	49	39	5	33		126	7	243
K. # PERSON HOURS ON ROAD CHECKS (J. x # PEOPLE)	26	348	29		243		646	402		10	204		616	19	1,281
L. # VEHICLES CHECKED (ROAD CHECKS ONLY)	1,710	5,880	3,275		23,700		34,565	7,105	6,245	219	6,173		19,742	1,080	55,387
M. # SEAT BELT CHARGES	71	123	90		1,305		1,589	244	136	2	177		559	0	2,148
N. # NEWSPAPER ARTICLES MENTIONING DRINKING DRIVING*	2	5	1		15		23	1	1	0	2		3	1	27

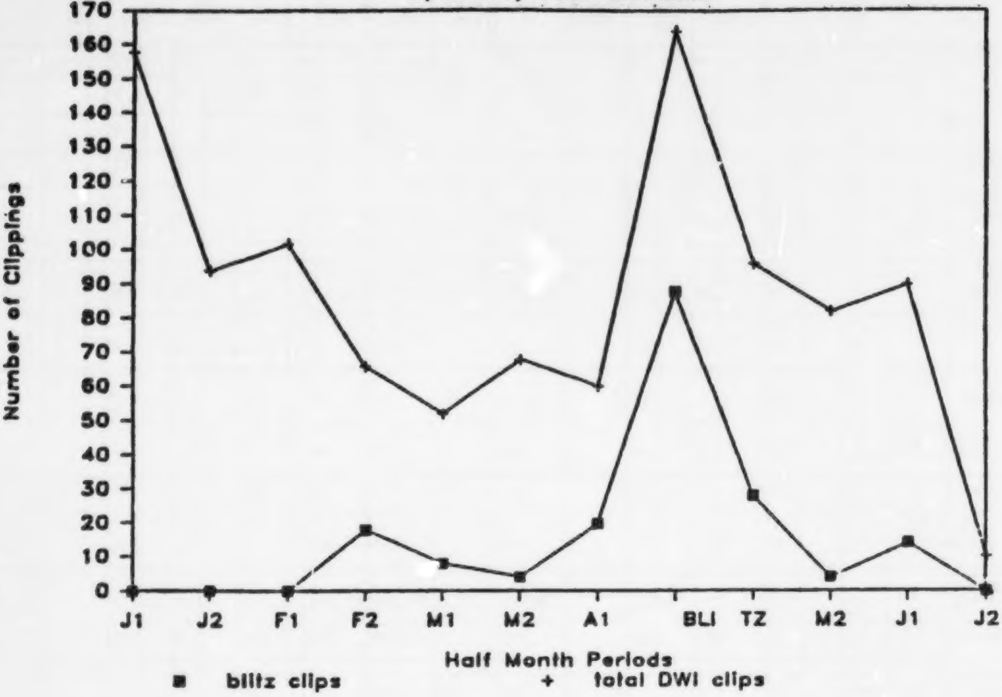
* AND/OR SEAT BELTS

APRIL- MAY 1984 BLITZ: R.C.M.P. DISTRICT #1 REPORTED DATA SUMMARY

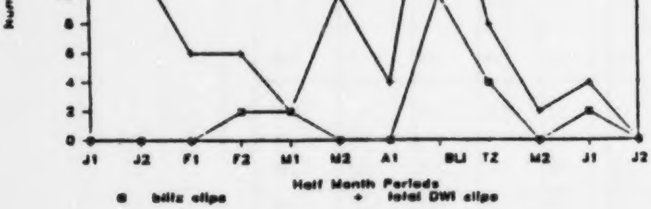
	R.C.M.P. DISTRICT # 1							DISTRICT #1 TOTAL
DATA TYPE	BURNABY	CHILL-IWACK	COQUIT-LAM	NORTH VAN	RICH-MOND	SURREY	VAN SUBDIV	
A. # FATAL COLLISIONS	1	2	0	0	0	0	1	4
B. # PERSONS KILLED	1	2	0	0	0	0	1	4
C. # INJURY COLLISIONS	109	21	43	41	63	122	97	496
D. # PERSONS INJURED	141	43	57	50	83	200	155	729
E. # PROPERTY DAMAGE ONLY COLLISIONS	500	159	167	218	200	349	332	1,925
F. TOTAL CHARGES (EXCLUDES G & M)	1,966	3,071	2,249	1,781	1,643	2,983	8,679	22,372
G. # PERSONS CHARGED DWI	29	68	29	38	36	68	118	386
H. # COLLISIONS INVOLVING ALCOHOL	31	16	12	17	28	35	41	180
I. # 214 M.V.A. SUSPENSIONS NOT INCLUDING THOSE UNDER G	66	78	59	96	52	200	231	782
J. # ROAD CHECK HOURS	293	152	75	58	20	547	639	1,784
K. # PERSON HOURS ON ROAD CHECKS (J. x # PEOPLE)	317	430	166	146	63	1,335	1,164	3,621
L. # VEHICLES CHECKED (ROAD CHECKS ONLY)	4,311	10,557	18,270	5,885	2,425	13,148	30,602	85,198
M. # SEAT BELT CHARGES	310	351	145	257	419	536	1,655	3,673
N. # NEWSPAPER ARTICLES MENTIONING DRINKING DRIVING*	4	6	3	10	3	3	25	54

* AND/OR SEAT BELTS

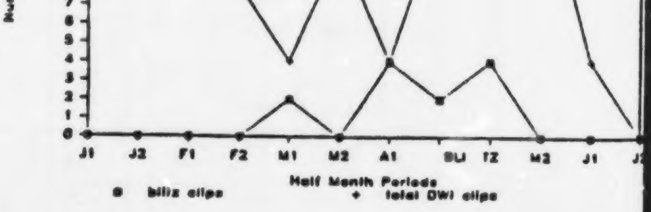
Appendix B


Newspaper Clippings, B.C.

April–May 1984 DWI Blitz

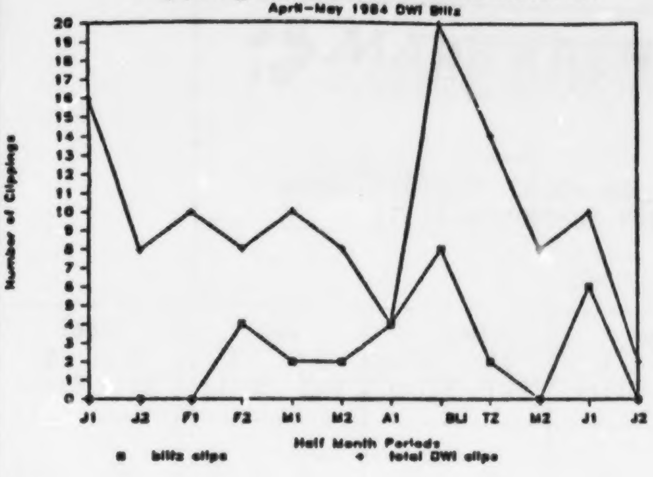

Clippings, Courtenay Subdivision

April–May 1984 DWI Blitz

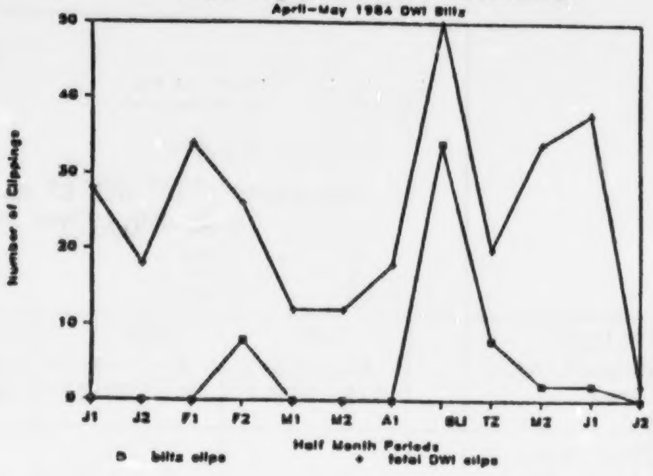

Clippings, Kamloops Subdivision

April–May 1984 DWI Blitz

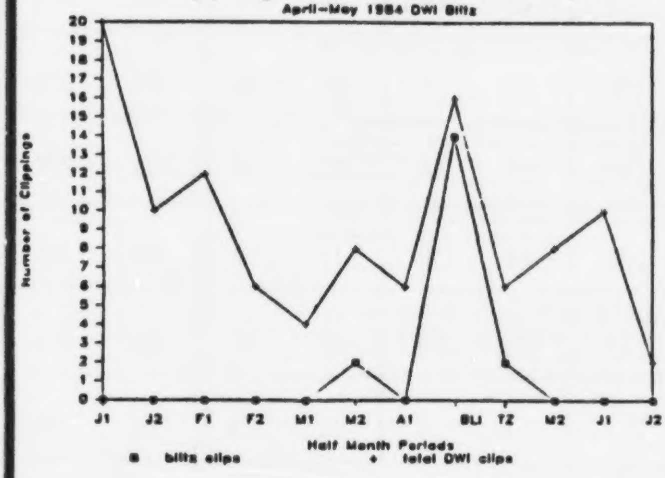
Clippings, Kelowna Subdivision



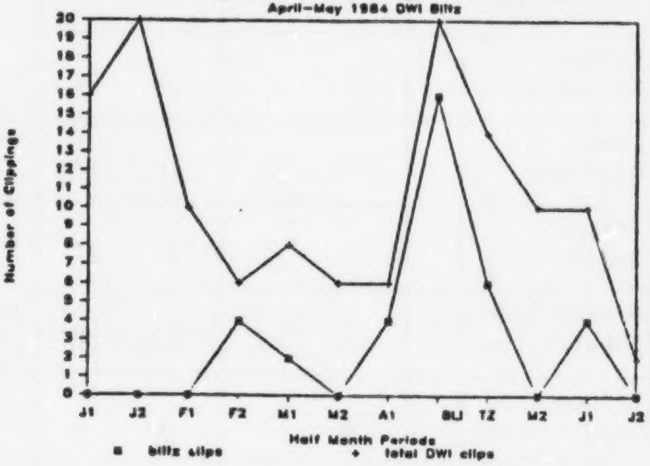
Clippings, Lower Mainland



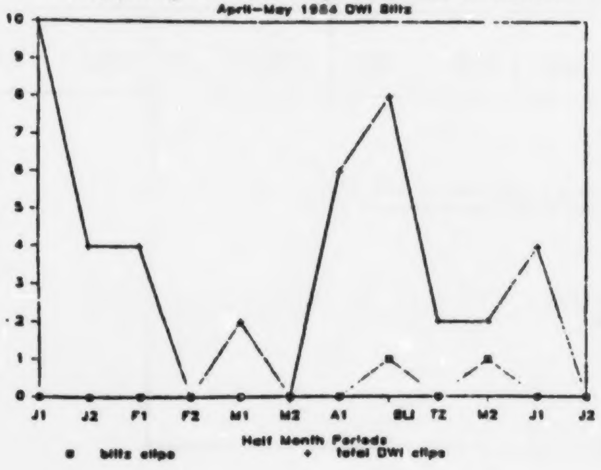
Clippings, Nelson Subdivision



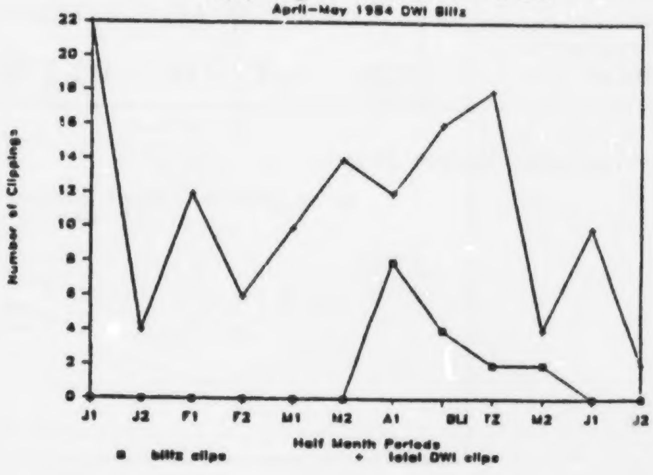
Clippings, Pr. George Subdivision



Clippings, Pr. Rupert Subdivision



Clippings, Victoria Area



NEWSPAPER CLIPPINGS BY MONTH AND POLICE REPORTING AREA: TOTAL D.W.I. AND PERCENT MENTIONING BLITZ

Police Reporting Area	Feb		Mar		Apr		May		Jun		Total	
	# DWI	% Blitz	# DWI	% Blitz	# DWI	% Blitz	# DWI	% Blitz	# DWI	% Blitz	# DWI	% Blitz
Courtenay Subdivision	11	9	9	11	22	55	10	20	6	33	58	31%
Kamloops Subdivision	17	0	15	7	14	43	28	14	10	10	84	14%
Kelowna Subdivison	16	13	14	14	20	40	22	36	16	38	88	30%
Lower Mainland	64	13	31	17	78	45	54	44	62	10	289	27%
Nelson* Subdivision	15	20	11	27	26	58	14	36	14	7	80	38%
Prince George Subdivision	13	23	13	8	20	75	24	58	18	22	88	42%
Prince Rupert Subdivision	8	0	6	0	10	7	4	0	11	0	39	3%
Victoria Area	17	6	19	5	27	63	22	18	21	5	106	23%
Provincial Total	161	11%	118	11%	217	50%	178	34%	158	13%	832	27%

*Includes Nelson City

Appendix C

MARKTREND
MARKETING RESEARCH INC

Job No: 84-541
Questionnaire No: 1 4 4

PRINCE RUPERT

TIME INTERVIEW STARTED 5:46 p.m.

112-
(F) 627-8310

Geographic Quotas:

Lower Mainland 1
Other B.C. - Area.............. 2
- Area.............. 3
- Area.............. 4
- Area.............. [✓ 5] ☐

Hello, this is Elaine, calling from Marktrend, a research firm in Vancouver. We're conducting a study (this evening/today), and your household has been selected..

CHECK GENDER QUOTA

I need to speak to (anyone/a man/a woman) in your household who is 16 years old or older. (Would that include yourself?) May I take just a few minutes of your time to ask you a few questions? Thank you.

IF R IS NOT 16, ASK FOR ANYONE OF AGE IN THE HH

IF R REFUSES, ARRANGE CALL-BACK

One aspect of travelling involves being on the road with people who have been drinking. My first few questions are on this topic. I would like you to imagine an average 150-pound person who has been at a party, bar or restaurant and has had three or four drinks, that is beers, glasses of wine, or single shot liquor drinks, within the previous hour. He then drives home, which takes him about 20 minutes and uses both main streets and residential streets. The time is 10 p.m. on a Saturday night.

1. How likely do you think it would be for this person to be pulled over by the police for drinking driving? Please answer using a scale from 0 to 10, where 0 means there would be no chance at all of being pulled over, and 10 means it is certain that the person would be pulled over. VERIFY RESPONSE

   5 — 0 5

   Refused 97
   Don't Know 98

2. If that person were pulled over, how likely do you think it would be that he or she would be charged with drinking driving, on the same scale from 0 to 10?

   9 — 0 9

   Refused 97
   Don't Know 98

3. And if this person were charged with drinking driving, how likely do you think it would be that he or she would be convicted?

   9 — 0 9

   Refused 97
   Don't Know 98

4. Can you name any groups or organizations that have been campaigning against drinking driving? IF YES: Which ones were they? AO

DO NOT READ

BCAA	1	☐
ICBC	1	☐
The Government	1	☐
Operation Counter-attack ...	1	☐
The Police	1	☐
Ministry of Transportation..	1	☐
Liquor Distribution Branch..	1	☐
MADD	1	☐
Citizens Groups	1	☐
Alcoholics Anonymous.........	1	☐
Labatt's	1	☐
Liquor Companies	1	☐
Broadcasters Association ...	1	☐
Other ____________________ ..	1	☐
None	[✓ 1]	1
Refused	1	☐
DK, Can't Think of Any	1	☐

5. Within the past month, have you seen a police drinking driver roadblock or spot check?

Yes	1		2
No	[✓ 2]	SKIP TO Q.7	
Refused	7		
Don't Know/Not Sure	8		

6. Within the past month, have you been stopped at such a roadblock or spot check?

Yes	1	6
No	2	
Skipped	[✓ 6]	
Refused	7	
Don't Know/Not Sure	8	

7. Within the past month, about how many times have you been a passenger in a vehicle in which the driver had been drinking? By drinking, I mean having more than two drinks.

Absolute Code	0	0 0
Refused	97	
Don't Know	98	

8. And within the past month, about how many times have you driven a vehicle after having more than two drinks?

Absolute Code	0	0 0
Refused	97	
Don't Know	98	

9. Have you ever been charged with driving while impaired?

Yes	1	2
No	[✓ 2]	
Refused	7	
Don't Know	8	

10. Finally, so that we can check the accuracy of our sample, may I ask how old you are?

Absolute Code 22 22
Refused 97
Don't Know 98

That is all the questions I have. Thank you very much for your time!

11. INTERVIEWER INDICATE SEX OF RESPONDENT
Male........................ 1
Female...................... [✓ 2] 2

Interviewer Number: 40 40

TIME INTERVIEW
ENDED 5:49 p.m.

INTERVIEW LENGTH 3 MIN. 03

EDITING TIME 1 MIN. 01

Supervisor Number: M 1

Coder Number: 7

Appendix D

Zero-order and Partial correlations on police activity, media coverage, D.W.I. charges, and alcohol-related casualty traffic accidents in British Columbia

VARIABLE	PCTALC	NALC	NDWICHG	NCLIP	BATCHK	PCTALC+1	NALC+1	Mean	Standard Deviation	# of Months
Month and Year (DATE)	-.36 p=.002	-.19	-.30 p=.008	.51 p=.000	-.22	-.31 p=.006	-.18			75
Percentage of Casualty Traffic Accidents Involving Alcohol (PCTALC)		.49 p=.000	.45 p=.000	-.59 p=.000	-.33 p=.01	.59 p=.000	.46 p=.000	14.9	2.1	75
Number of Casualty Traffic Accidents Involving Alcohol (NALC)			.73 p=.000	-.50 p=.000	-.20	.05	.77 p=.000	307.8	74.9	75
Number of DWI Charges (NDWICHG)	.56 p=.001	.79 p=.000		-.33 p=.02	-.06	.10	.51 p=.000	1735.1	191.1	75
Number of DWI Press Clippings (NCLIP)	-.60 p=.000	-.41 p=.02			.59 p=.000	-.61 p=.000	-.71 p=.000	134.3	85.9	51
Number of Vehicles Stoppin in BATmobile Roadchecks (BATCHK)	.22	.07				-.28 p=.03	-.37 p=.004	17368.3	13273.2	60
Percentage of Casualty Traffic Accidents Involving Alcohol in the Following Month (PCTALC+1)			-.14	-.46 p=.007	.17		.50 p=.000	14.9	2.1	74
Number of Casualty Traffic Accidents Involving Alcohol in the Following Month (NALC+1)			.38 p=.03	-.46 p=.008	.02			309.2	74.0	74

UPPER DIAGONAL -- Zero Order correlations

LOWER DIAGONAL -- Partial correlations controlling for DATE, NDWICHG,NCLIP,BATCHK

RESTRAINT DEVICE USE STUDIES

Trends in Reported Restraint Device Use by
Occupants in Injury/Death Traffic Accidents,
British Columbia, January 1977- June 1983

Trends in Restraint Device Use by Young Occupants
in Casualty Traffic Accidents
British Columbia, January 1980- September 1984

Restraint Device Use and Ejection From Vehicle

A Note on the Effectiveness of "80% Clicks"

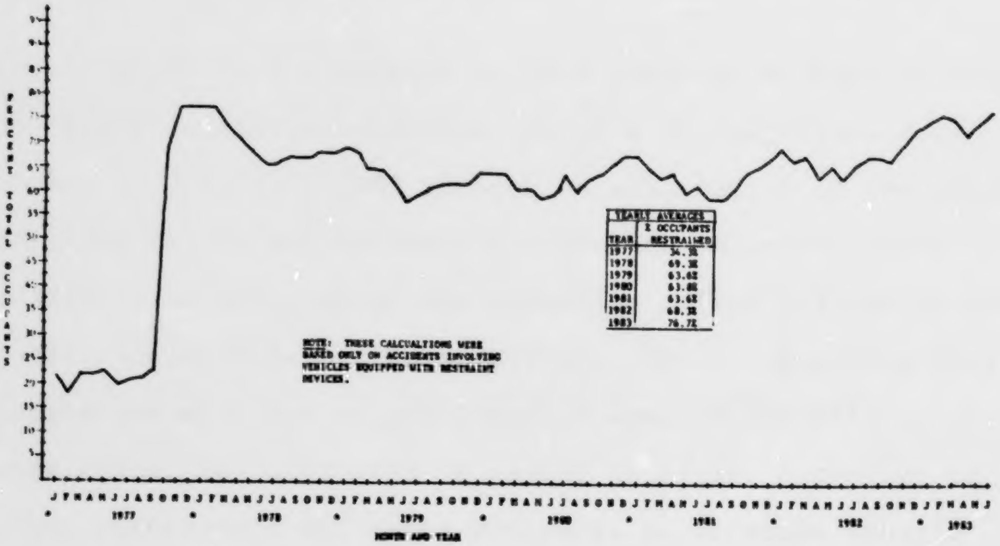
Trends in Reported Restraint Device Use by Occupants in Injury/Death Traffic Accidents, British Columbia, January 1977- June 1983

SUMMARY

Considering occupant restraint device use in injury/death traffic accidents reported on the Traffic Accident Report Form from January 1977 to June 1983 in B.C.:

1. The 1977 restraint device legislation was very effective and immediately increased restraint device use by vehicle occupants in injury/death traffic accidents to about three and a half times the pre-legislation level.
2. By mid 1979, restraint device use had dropped to only about three times the pre-legislation levels, but has increased gradually and steadily since then back to about three and a half times the pre-legislation levels.
3. Reported restraint device use by occupants of vehicles in injury/death traffic accidents is highest in December - January and lowest in the mid summer, suggesting that the anti-drinking driving media and enforcement campaigns occurring in the winter "holiday season" may have a more general effect on traffic safety practices, and that more effort needs to be put into summer traffic safety campaigns.

FIGURE 1
INJURY/DEATH TRAFFIC ACCIDENTS, JANUARY 1977- JUNE 1983, BRITISH COLUMBIA:
PERCENT OF OCCUPANTS USING RESTRAINT DEVICES.



TRENDS IN REPORTED RESTRAINT DEVICE USE BY OCCUPANTS IN INJURY/DEATH TRAFFIC ACCIDENTS, BRITISH COLUMBIA, JANUARY 1977 - JUNE 1983

In November 1977 it became an offence to be an occupant in a motor vehicle in British Columbia without using a restraint device, except in a few specific and limited situations. Since that time, restraint device use has been encouraged both through enforcement and media approaches, and a number of surveys have been carried out to determine the effects of this 1977 legislation on vehicle occupant restraint device use. However, because of the expense of conducting surveys and the number of different groups doing the surveys, restraint device use has not been monitored regularly or in the same manner from survey group to survey group.

Therefore, it is the purpose of this paper to attempt to assess the trends in restraint device use on a monthly basis from January 1977 to June 1983 through an examination of the reported restraint device use of vehicle occupants in injury/death accidents, as reported by the attending police officer on the Traffic Accident Report Form (MV104). It is hoped that this examination will not only illuminate some of the effects of the legislation, but will also be useful in giving direction to future enforcement and media pressures to persuade vehicle occupants to comply with this legislation.

METHOD

Source of Incident Information:

Accident reports are compiled and put into a computer-readable form by the Ministry of Transportation and Highways, and from this, a wide variety of analyses can be done.[1] The subset of accidents that this report deals with is that set of accidents involving injury or death. The reason for limiting the sample to this group is twofold: First, it would be very costly in terms of computer time to deal with all reported accidents - in B.C. in 1982 there were 118,147 reported accidents, but only 24,220 accidents (20.5%) involved injury or death. Second, many accidents not involving injury or death are reported by drivers to the police some time after the accident, whereas those involving injury or death are usually attended by police who also fill out the accident report forms (MV104). Therefore, the data from reports completed by the police are likely to be the most valid and reliable.

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[1] It should be noted here that information on accidents is constantly being revised and improved by the Motor Vehicle Department. It follows that the figures drawn from one set of data may differ from figures drawn from an updated set, and therefore any figures produced by the M.V.D. after the creation of this data set (February, 1983) which contradict these figures should be considered correct.

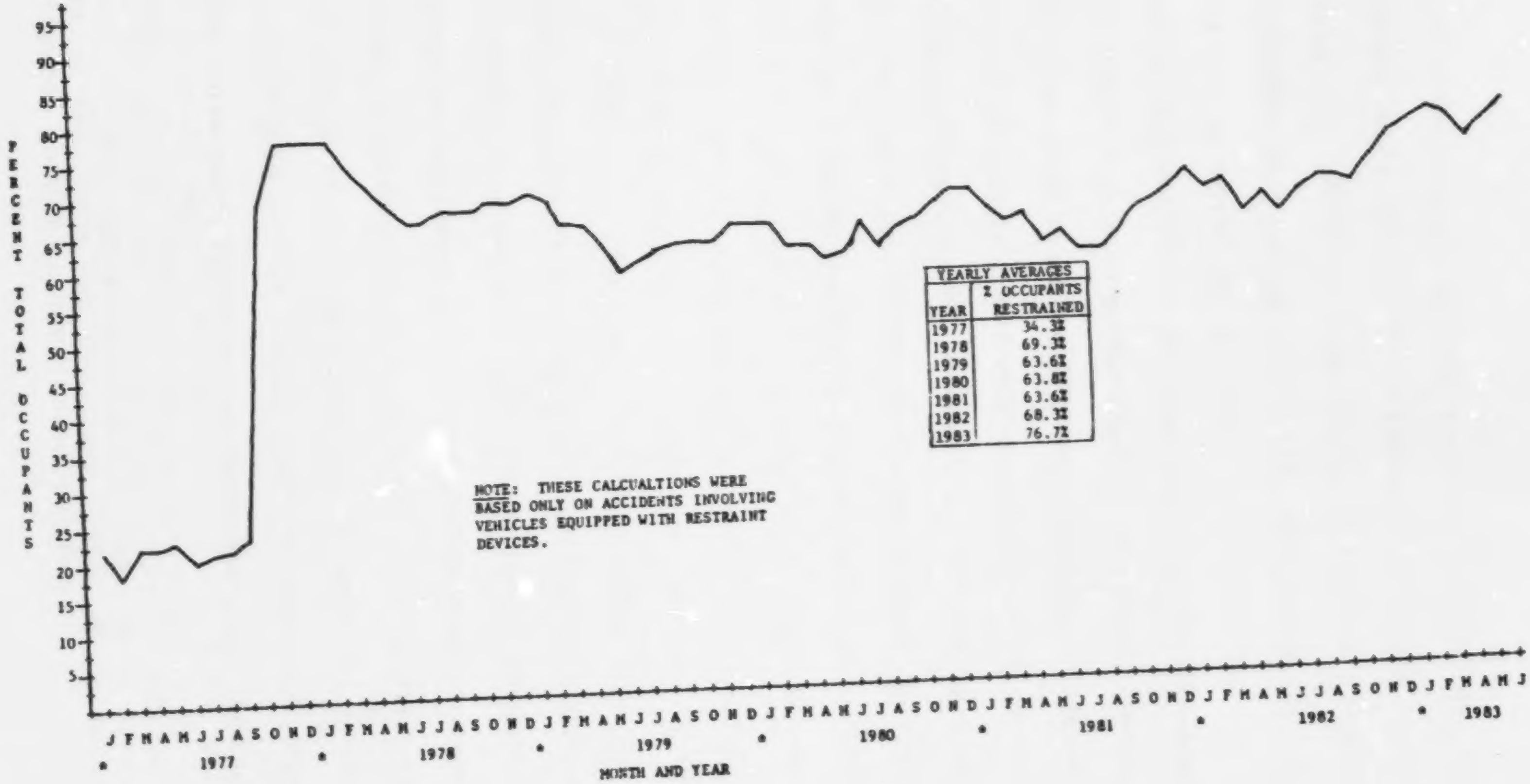
Finally, while some research on traffic accidents is limited to only those accidents resulting in deaths, this research is based on accidents involving injury and/or death. The reason for this is that very often the difference between an accident involving injury and one involving death is, in terms of the physics of the accident, minimal - a matter of a few miles an hour difference in speed or a few centimeters difference in the location of the impact. Therefore, by combining injury-related and death-related accidents into one group, the research can be based on a sample of accidents at least forty times greater than the number of death-related accidents and thus one can have considerably more confidence in the reliability of the results of the research.

Analyses:

From the British Columbia January 1977 through May 1983 Traffic Accident Report Forms (MV104) for accidents involving injury and/or death, all accidents involving vehicles equipped with restraint devices were compiled. These accident reports were then divided in terms of the years and months of the accident occurrences and examined with regard to the proportion of occupants that were recorded as wearing a restraint device.

FIGURE 1

INJURY/DEATH TRAFFIC ACCIDENTS, JANUARY 1977- JUNE 1983, BRITISH COLUMBIA:
PERCENT OF OCCUPANTS USING RESTRAINT DEVICES.



YEARLY AVERAGES	
YEAR	% OCCUPANTS RESTRAINED
1977	34.3%
1978	69.3%
1979	63.6%
1980	63.8%
1981	63.6%
1982	68.3%
1983	76.7%

NOTE: THESE CALCUALTIONS WERE BASED ONLY ON ACCIDENTS INVOLVING VEHICLES EQUIPPED WITH RESTRAINT DEVICES.

RESULTS AND DISCUSSION

Tables 1 - 7 in Appendix A illustrate the proportion of occupants recorded as wearing restraint devices in injury/death accidents where the vehicle(s) were equipped with such devices from January 1977 to June 1983 as recorded on the British Columbia Traffic Accident Report Form (MV104). Figure 1 on page 5 represents this same information in graphic form.

Before attempting to interpret these data, it must be noted that these figures could be less valid than one might hope, as they represent information collected by the attending officer from both his/her own observations and from the occupant's reports. In as much as, since late in 1977, it has been illegal not to wear a restraint device (except in a few specific instances), there is likely some aspect of exaggeration of reported restraint device use on the part of the vehicle occupants, thus inflating the values somewhat.

On the other hand, there is little reason to believe that the extent of the possible exaggeration of restraint device use on the part of the vehicle occupants should vary greatly from month to month. That is, there is no reason to believe that a higher proportion of occupants would misrepresent their behaviours to the attending officer in say June as opposed to say August. Therefore, while the absolute value of these numbers may be suspect, the trends that they represent are probably reasonably reliable.

Keeping these qualifications in mind, a number of points can be drawn from these data. From Figure 1 it can easily be seen that the 1977 restraint device legislation dramatically increased restraint device use by occupants of vehicles involved in injury/death accidents to more than three and a half times the pre-legislation rate. This initial extreme effect did not persist, and by the summer of 1979, reported use levels dropped to about three times the pre-legislation level. However, since that time, reported restraint device use by serious accident vehicle occupants gradually and steadily has risen till it now stands very close to the immediately post-legislation rates of about three and a half times the pre-legislation rates.

Within these broad changes, one notes some systematic seasonal variations in these reports: it appears that the highest proportions of restraint device use are reported in the December - January period, while the lowest are reported in the June - July periods. The former trend might be explained by the notion that the media and enforcement campaigns against drinking driving that occur in December - January have a sort of "halo" effect and increase occupant's awareness of traffic safety in all areas, including restraint device use. The latter trend may be partially accounted for by the summer influx of tourists into British Columbia who come from places where they are not required to "buckle up" and thus have not got into that habit, although this by no means could account for all of the observed reduction in restraint device use.

In summary, the following points can be drawn from these figures:

1. The 1977 restraint device legislation was very effective and immediately increased restraint device use by vehicle occupants in injury/death traffic accidents to about three and a half times the pre-legislation level.

2. By mid 1979, restraint device use had dropped to only about three times the pre-legislation levels, but has increased gradually and steadily since then back to about three and a half times the pre-legislation levels.

3. Reported restraint device use by occupants of vehicles in injury/death traffic accidents is highest in December - January and lowest in the mid summer, suggesting that the anti-drinking driving media and enforcement campaigns

occurring in the winter "holiday season" may have a more general effect on traffic safety practices, and that more effort needs to be put into summer traffic safety campaigns.

APPENDIX A

Percent of Occupants Using Restraint Devices:

Table 1 - 1977 January - December

Table 2 - 1978 January - December

Table 3 - 1979 January - December

Table 4 - 1980 January - December

Table 5 - 1981 January - December

Table 6 - 1982 January - December

Table 7 - 1983 January - June

TABLE 1 - 1977
PERCENT OF OCCUPANTS USING RESTRAINT DEVICES: INJURY/DEATH TRAFFIC ACCIDENTS, B.C., JANUARY - DECEMBER 1977

MONTH	TOTAL # OCCUPANTS	PERCENT OCCUPANTS USING RESTRAINT DEVICES
January	2,690	22.2
February	2,635	17.2
March	2,887	21.2
April	2,845	21.0
May	3,621	21.7
June	3,273	19.5
July	3,811	19.8
August	3,957	22.0
September	3,427	23.7
October	3,440	66.9
November	3,313	76.6
December	3,315	76.8
Provincial Total	39,214	34.3%

NOTE: These calculations were based only on accidents where the vehicle(s) were equipped with restraint devices.

TABLE 2 - 1978
PERCENT OF OCCUPANTS USING RESTRAINT DEVICES: INJURY/DEATH TRAFFIC ACCIDENTS, B.C., JANUARY - DECEMBER 1978

MONTH	TOTAL # OCCUPANTS	PERCENT OCCUPANTS USING RESTRAINT DEVICES
January	2,586	76.9
February	2,496	76.6
March	2,515	74.1
April	2,724	70.7
May	3,207	68.8
June	3,273	65.9
July	3,522	66.3
August	3,892	67.4
September	3,843	67.1
October	3,689	67.4
November	3,935	68.1
December	4,104	68.1
Provincial Total	39,786	69.3%

NOTE: These calculations were based only on accidents where the vehicle(s) were equipped with restraint devices.

TABLE 3 - 1979
PERCENT OF OCCUPANTS USING RESTRAINT DEVICES: INJURY/DEATH TRAFFIC ACCIDENTS, B.C., JANUARY - DECEMBER 1979

MONTH	TOTAL # OCCUPANTS	PERCENT OCCUPANTS USING RESTRAINT DEVICES
January	3,493	68.8
February	3,683	67.9
March	2,999	65.0
April	3,331	64.7
May	3,500	63.3
June	4,042	59.1
July	4,100	59.9
August	4,122	61.8
September	4,106	62.9
October	4,211	63.0
November	4,321	63.2
December	4,533	65.0
Provincial Total	46,441	63.6%

NOTE: These calculations were based only on accidents where the vehicle(s) were equipped with restraint devices.

TABLE 4 - 1980
PERCENT OF OCCUPANTS USING RESTRAINT DEVICES: INJURY/DEATH TRAFFIC ACCIDENTS, B.C., JANUARY - DECEMBER 1980

MONTH	TOTAL # OCCUPANTS	PERCENT OCCUPANTS USING RESTRAINT DEVICES
January	3,352	64.8
February	3,488	65.1
March	3,546	62.2
April	3,779	62.4
May	4,253	59.7
June	4,536	60.6
July	4,654	65.2
August	5,104	60.8
September	4,149	63.8
October	4,731	64.8
November	5,378	67.1
December	4,553	68.5
Provincial Total	51,523	63.8%

NOTE: These calculations were based only on accidents where the vehicle(s) were equipped with restraint devices.

TABLE 5 - 1981
PERCENT OF OCCUPANTS USING RESTRAINT DEVICES: INJURY/DEATH TRAFFIC ACCIDENTS, B.C., JANUARY - DECEMBER 1981

MONTH	TOTAL # OCCUPANTS	PERCENT OCCUPANTS USING RESTRAINT DEVICES
January	3,757	67.7
February	3,996	66.0
March	4,150	63.5
April	4,193	64.5
May	4,911	62.0
June	5,072	62.5
July	5,089	60.0
August	4,955	59.8
September	4,274	62.3
October	4,650	64.9
November	4,457	65.5
December	5,088	66.5
Provincial Total	54,592	63.6%

NOTE: These calculations were based only on accidents where the vehicle(s) were equipped with restraint devices.

TABLE 6 - 1982
PERCENT OF OCCUPANTS USING RESTRAINT DEVICES: INJURY/DEATH TRAFFIC ACCIDENTS, B.C., JANUARY - DECEMBER 1982

MONTH	TOTAL # OCCUPANTS	PERCENT OCCUPANTS USING RESTRAINT DEVICES
January	3,715	70.4
February	3,163	67.4
March	2,563	65.9
April	2,730	64.2
May	3,023	65.9
June	3,273	63.6
July	3,704	66.2
August	3,484	68.7
September	3,313	68.7
October	3,916	68.3
November	4,018	71.8
December	3,580	75.4
Provincial Total	40,482	68.3%

NOTE: These calculations were based only on accidents where the vehicle(s) were equipped with restraint devices.

TABLE 7 - 1983
PERCENT OF OCCUPANTS USING RESTRAINT DEVICES: INJURY/DEATH TRAFFIC ACCIDENTS, B.C., JANUARY - JUNE 1983

MONTH	TOTAL # OCCUPANTS	PERCENT OCCUPANTS USING RESTRAINT DEVICES
January	2,642	75.5
February	2,567	78.0
March	2,683	76.5
April	2,876	74.1
May	3,093	76.3
June	3,444	79.2
July		
August		
September		
October		
November		
December		
Provincial Total	17,296	76.7%

NOTE: These calculations were based only on accidents where the vehicle(s) were equipped with restraint devices.

Trends in Restraint Device Use by Young Occupants in Casualty Traffic Accidents
British Columbia, January 1980- September 1984

SUMMARY

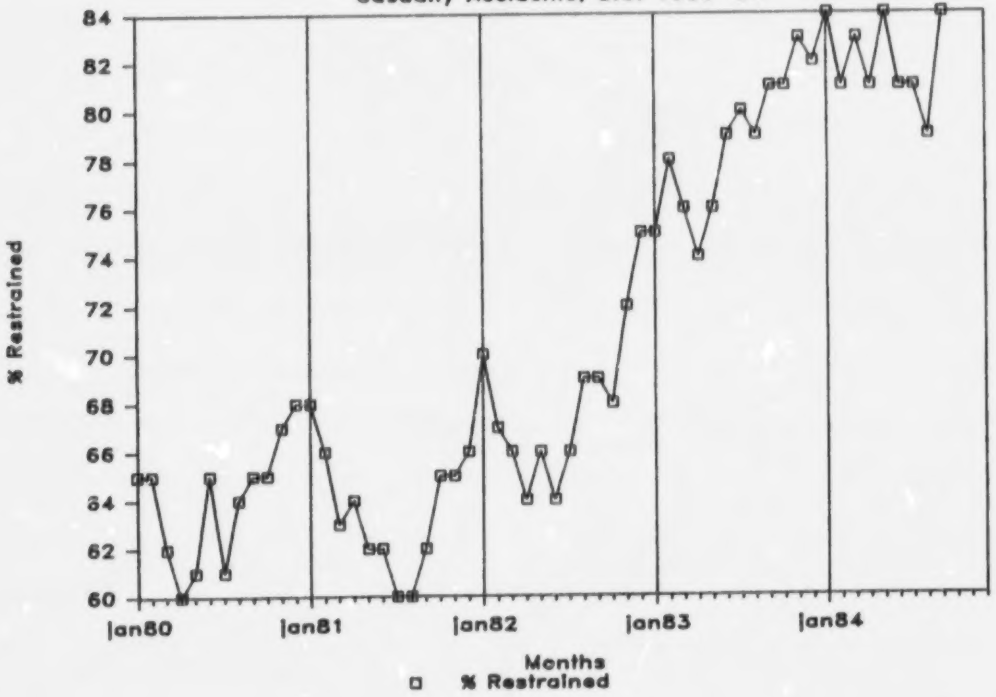
The use of restraint devices in motor vehicles has increased substantially between 1980-1984, especially within the younger age groups, as reflected in occupant restraint device use as reported on Traffic Accident Report Forms (MV104) completed by attending police officers at casualty traffic accidents. To illustrate, between 1980-1984, reported restraint device use increased by 70% for the 0-5 year old group, 57% for the 6-12 year old group, 36% for the 13-17 year old group, and 28% overall. From the MV104 casualty accident reports, the use rates in 1980 vs 1984 for these age groups were as follows: 0 - 5 year old group - 44% vs 75%; 6 - 12 year old group - 47% vs 74%; 13 - 17 year old group - 59% vs 80%; and overall 64% vs 82%. Further, in all years and all age categories examined, use rates were highest in the Winter months and lowest in the Summer months. However, it must be noted that the overall rate of increase appears to be levelling off.

It can be reasonably argued that the increase in use rates that began in late 1981 and has continued to date can, in part, be attributed to increased restraint device use law enforcement and "blitzes", to intensive elementary school programs and to increased public education and awareness campaigns, all assisted by the Traffic Safety Education Department of I.C.B.C. As use rates appear lowest in the Summer, perhaps this would be a particularly appropriate time of year for future enforcement and education campaigns. Finally, as the use rates appear to be reaching a plateau, current enforcement and education efforts must be maintained or even increased.

*Actual use rates determined by observational surveys are, on the average, about 10-15% less than reported casualty traffic accident rates.

% Occupants Restrained

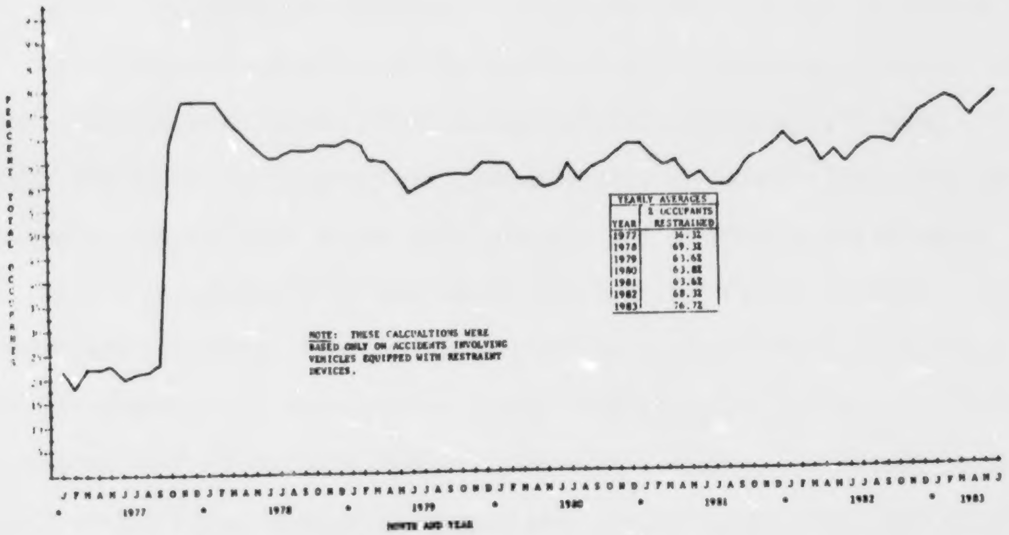
Casualty Accidents, B.C. 1980-84



TRENDS IN RESTRAINT DEVICE USE BY YOUNG OCCUPANTS IN CASUALTY TRAFFIC ACCIDENTS, BRITISH COLUMBIA, JANUARY, 1980 - SEPTEMBER, 1984

The graph below, taken from Trends in Injury/Death Traffic Accidents, B.C. January, 1977 - June, 1983 (Ministry of Attorney General, October, 1983), clearly shows the dramatic effect of the 1977 restraint device use legislation. This legislation required virtually all persons over 6 years of age to wear a restraint device when operating a motor vehicle equipped with same, and its enactment produced a sharp rise in restraint device use, as reflected by the proportions of occupants in casualty traffic accidents who were reported as wearing restraint devices by the investigating police officer.

FIGURE 1
INJURY/DEATH TRAFFIC ACCIDENTS, JANUARY 1977- JUNE 1983, BRITISH COLUMBIA:
PERCENT OF OCCUPANTS USING RESTRAINT DEVICES.



YEARLY AVERAGES	
YEAR	% OCCUPANTS RESTRAINED
1977	34.3%
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1979	63.6%
1980	63.8%
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1982	68.3%
1983	76.7%

NOTE: THESE CALCULATIONS WERE BASED ONLY ON ACCIDENTS INVOLVING VEHICLES EQUIPPED WITH RESTRAINT DEVICES.

As one might expect from the continued high rate of restraint device use consequent to the legislation, this law has been widely publicized and enforced throughout the province. For example, while day-to-day enforcement figures are not available, it is know that the police log about 8,000 seat belt charges during each periodic drinking driving roadcheck "blitz". Further the May 20 - June 4, 1983 "80% Clicks" restraint device use police roadcheck blitz and publicity campaign significantly increased use, which in turn reduced the level of injury to below that which would have been expected without the campaign (see A Note on the Effectiveness of "80% Clicks", Ministry of Attorney General, October, 1983).

However, while at the time of this writing there has been no new legislation enacted in the province in this area, there is reason to believe that the rate and pattern of restraint device use may be changing, and therefore to reexamine and update trend figures with particular emphasis on the use rates of younger occupants. To elaborate, first, the frequency of month-long province-wide police roadcheck activity has increased from yearly during the period 1977-1982 to twice a year in 1983, to three times a year in 1984. Second, for the past two years the majority of elementary schools in the province have incorporated restraint device use ("Captain Click") lessons into their regular teaching curriculum, while high school traffic committees have been vigorously promoting restraint device use among young adults. Third, for the past year or more the B. C. health professionals have been visibly promoting infant and child restraint device use. Fourth, the Insurance Corporation of British Columbia (I.C.B.C.) has, over the past two years, been actively involved in promoting restraint device use among secondary school students using in-school programs. Finally, the media, municipal councils and businesses have actively supported public education campaigns on restraint device use. It must be noted that the Traffic Safety Education Department of I.C.B.C. was instrumental in the establishment and encouragement programs and activities. (For more information on these programs contact the above department at 151 W. Esplanade, N. Vancouver, V7M 3H9 or phone 604-661-6651.) In short, over the past two years the issue has been actively pursued by B.C. citizens, especially with regard to the use of restraint devices by young occupants.

Consequently, it is the purpose of this paper to examine restraint device use from January 1980 to September 1984 with particular emphasis on the use of these devices by young occupants of motor vehicles.

METHOD

Traffic Accident Report Forms (MV104) completed by attending police officers at casualty traffic accidents (i.e., those producing injury and/or death) are compiled into computer-readable form by the Motor Vehicle Department (M.V.D.) of the Ministry of Transportation and Highways. These computer tapes are supplied to the CounterAttack program by the Ministry, and the analyses herein are based on those tapes. However, as these records are consistently being updated by M.V.D., any figures produced by that Department ought to supersede any produced by this Program.

From the MV104 reports involving casualty traffic accidents from January 1980 to September 1984, the monthly percentage restraint device use rate was calculated for the following age groups: 0-5 years, 6-12 years, 13-17 years, 18+ years and overall. By comparing reported restraint device use in these sorts of traffic accidents to observed restraint device use from provincial surveys, it has been shown that the MV104 restraint device use rates are reliably about 10-15% higher than the actual restraint device use rates in the general driving population (the inflated rates on the MV104 may, in part, be attributed to the public falsely reporting use in order to avoid being charged for non-use). It follows that changes in the rate of restraint device use taken from casualty traffic accidents as reported on the MV104 can be taken as accurate and as reflecting changes in use rates by the general driving public, while the actual rates drawn from the MV104 casualty traffic accident reports should be reduced by about 10-15% in order to reflect actual use levels by the driving public.

RESULTS

Tables 1 through 5 and Figures 1 and 2 illustrate the changes in restraint device use from January 1980 through September 1982, as reflected in the reported restraint device use in casualty traffic accidents. (It should be noted that these figures are based only on occupants of vehicles equipped with restraint devices, and that actual wearing rates in the general driving population are probably only about 10-15% less than the figures reported on these MV104 analyses, as noted in the Method section of this report.)

As can be seen from these data, overall wearing rates showed a 0% increase from 1979-1980 and from 1980-1981, increased at +6% between 1981-82 and +13% between 1982-1983, and +5% between 1983-1984 (year to date). However, it can also be seen that the younger age groups showed a larger percentage increase from year to year then the overall percentage increase. For example, the overall percent increase in wearing rates between 1981-1982 was +6%, while for the 0-5 year old group it was +19%, for the 6-12 year old group it was +10% , and for the 13-17 year old group it was +8%. Similarly, the percentage increase in wearing rates for the younger groups between 1982-1983 were greater than for the overall figure: 0-5 years, +29%; 6-12 years, +33%; 13-17 years, +17%; overall, +13%. Finally, the 1983-1984 percentage change figures across the age groups appear to be stablizing, with all the categories being within a few points of the overall percent change rate of +5%.

Turning from the percentage change in wearing rates to the actual reported wearing rates, Figure 1 illustrates that the overall pattern appears to be that in any given year, the older the group the greater the wearing rate, but that the wearing rate for young groups has been rapidly catching up to that of older groups over the past two and one half years. To illustrate, in 1980 the 0-5 year old wearing rate was 44% and the +18 year old rate was 67%, while in 1981-1984 they were 47% vs 66%, 56% vs 71%, 72% vs 81% and 75% vs 84% respectively.

Finally, Figure 2 not only shows the overall increase in reported restraint device use as taken from MV104 reports on casualty traffic accidents, but also clearly shows the seasonality in these rates, with the Winter months producing the highest use rates and the Summer months the lowest rates.

FIGURE 1

% Occupants Restrained by Age

Casualty Accidents, B.C. 1980–84

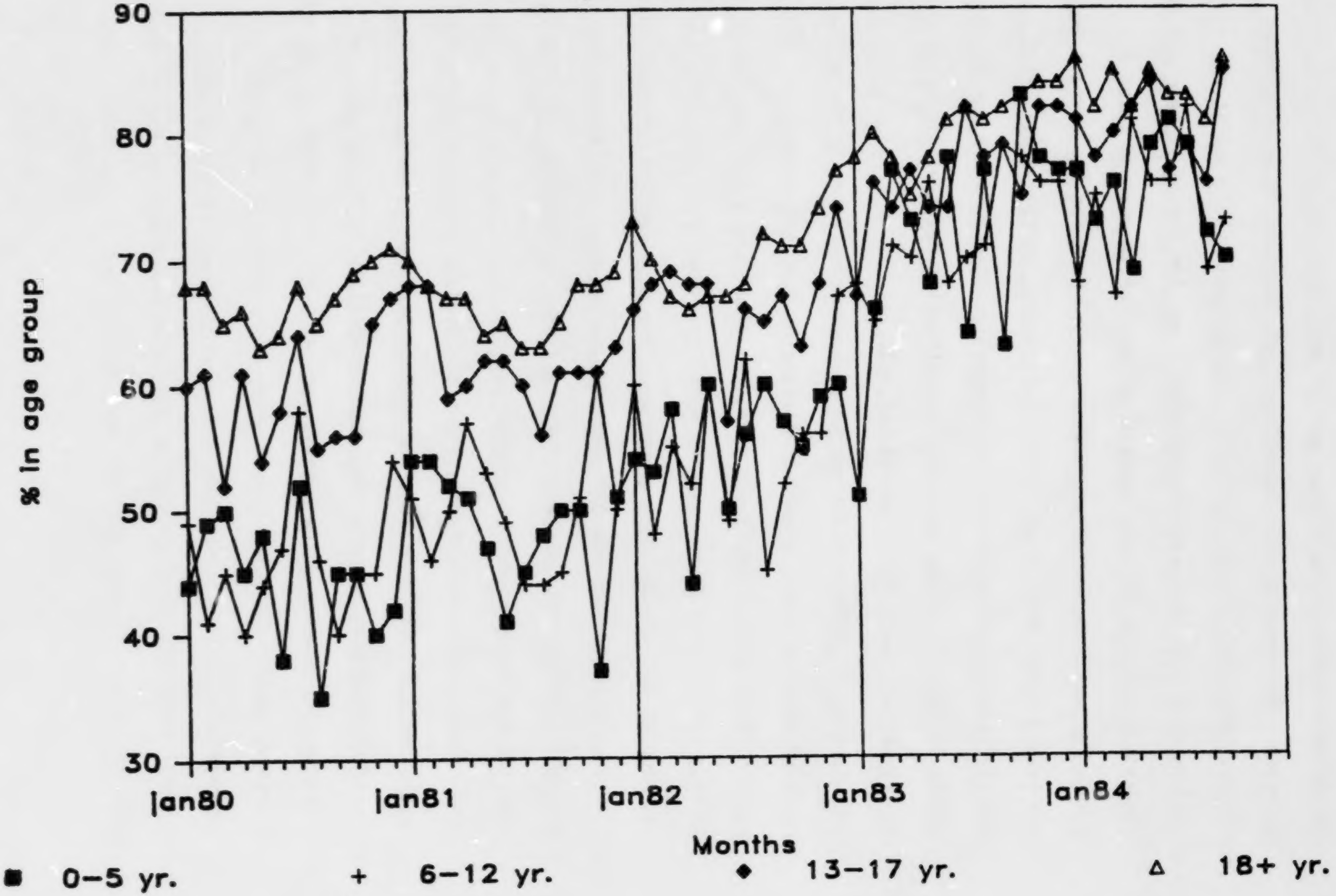

FIGURE 2

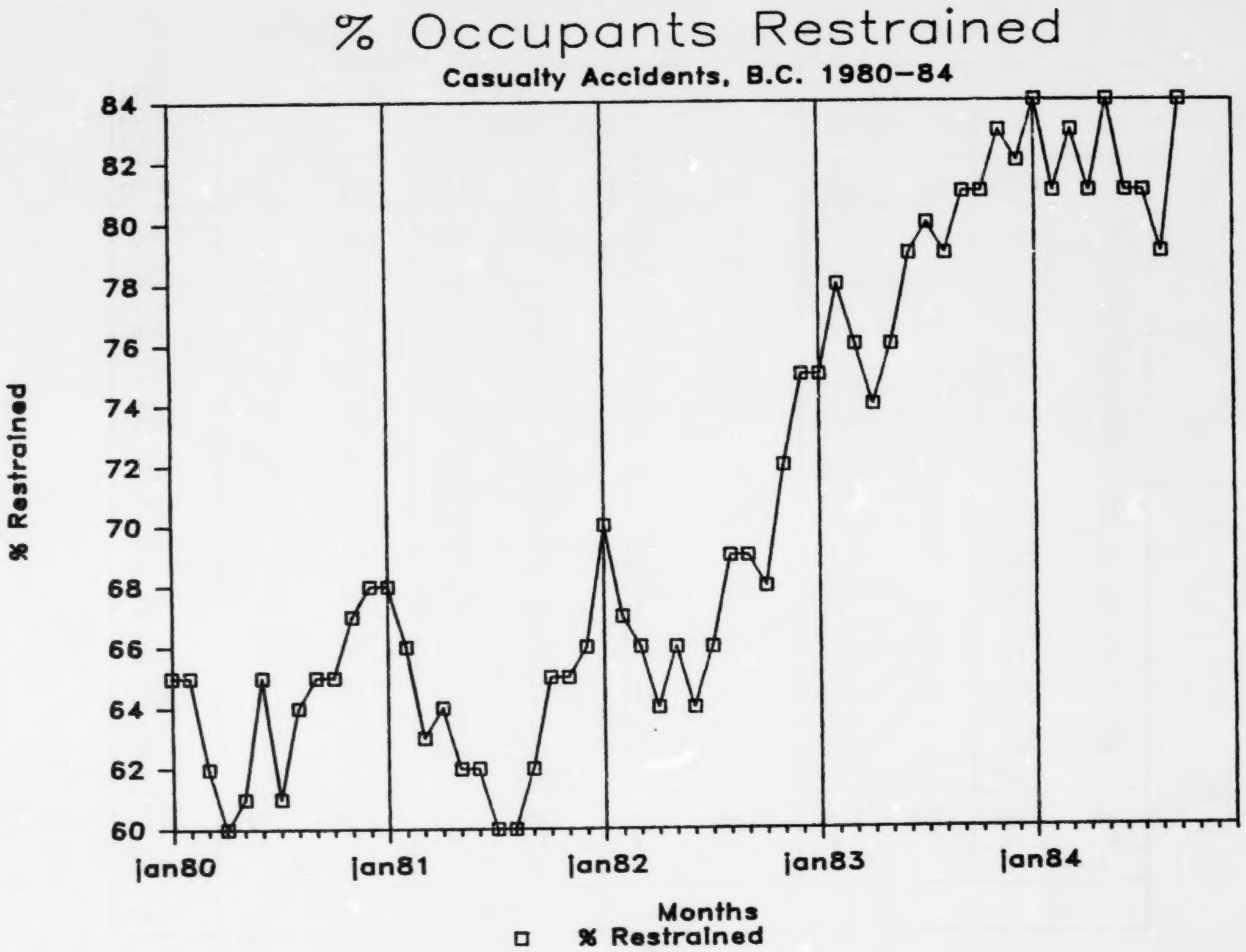
% Occupants Restrained
Casualty Accidents, B.C. 1980–84
% Restrained
84
82
80
78
76
74
72
70
68
66
64
62
60
Jan80
Jan81
Jan82
Jan83
Jan84
Months
□ % Restrained

TABLE 1

Total Number of Occupants and Percent Wearing Restraint Devices, Casualty Traffic Accidents, British Columbia, 1980

Month	Age Groups									
	0 - 5		6 - 12		13 - 17		18+		Overall	
	# Occ.	% Rest.	# Occ.	% Rest.	# Occ.	% Rest.	# Occ.	% Rest.	# Occ.	% Rest.
Jan	111	44	117	49	321	60	2754	68	3352	65
Feb	105	49	103	41	281	61	2960	68	3488	65
Mar	93	50	99	45	373	52	2931	65	3546	62
Apr	127	45	126	40	444	61	3008	66	3779	62
May	130	48	102	44	490	54	3446	63	4253	60
Jun	120	38	121	47	595	58	3591	64	4536	61
Jul	125	52	182	58	507	64	3753	68	4654	65
Aug	170	35	198	46	587	55	4046	65	5104	61
Sep	107	45	87	40	474	56	3411	67	4149	64
Oct	138	45	140	45	477	56	3898	69	4731	65
Nov	145	40	148	45	633	65	4378	70	5378	67
Dec	137	42	169	54	454	67	3741	71	4553	68
Total	1508	44%	1592	47%	5636	59%	41917	67%	51523	64%
% Change Previous Year	N/A		N/A		N/A		N/A		0%	

TABLE 2

Total Number of Occupants and Percent Wearing Restraint Devices, Casualty Traffic Accidents, British Columbia, 1981

Month	Age Groups									
	0 - 5		6 - 12		13 - 17		18+		Overall	
	# Occ.	% Rest.	# Occ.	% Rest.	# Occ.	% Rest.	# Occ.	% Rest.	# Occ.	% Rest.
Jan	128	54	113	51	391	68	3073	70	3757	68
Feb	108	54	97	46	429	68	3300	68	3996	66
Mar	124	42	103	50	484	59	3347	67	4150	63
Apr	105	51	134	57	452	60	3414	67	4193	64
May	136	47	142	53	552	62	3988	64	4911	62
Jun	142	41	150	49	597	62	4078	65	5072	62
Jul	154	45	194	44	583	60	4047	63	5089	60
Aug	143	48	195	44	531	56	3976	63	4955	60
Sep	136	50	133	45	434	61	3486	65	4274	62
Oct	119	50	132	50	486	61	3832	68	4650	65
Nov	106	37	123	61	453	61	3696	68	4457	55
Dec	170	51	180	50	513	63	4156	69	5088	66
Total	1571	47%	1696	50%	5905	61%	44393	66%	55592	64%
% Change Previous Year	+ 7%		+ 6%		+ 3%		- 1%		0%	

TABLE 3

Total Number of Occupants and Percent Wearing Restraint Devices, Casualty Traffic Accidents, British Columbia, 1982

Month	Age Groups									
	0 - 5		6 - 12		13 - 17		18+		Overall	
	# Occ.	% Rest.	# Occ.	% Rest.	# Occ.	% Rest.	# Occ.	% Rest.	# Occ.	% Rest.
Jan	117	54	114	60	339	66	3097	73	3715	70
Feb	79	53	111	48	308	68	2621	70	3163	67
Mar	50	58	60	55	223	69	2188	67	2563	66
Apr	59	44	69	52	300	68	2255	66	2730	64
May	75	60	76	60	295	68	2525	67	3023	66
Jun	113	50	113	49	349	57	2629	67	3273	64
Jul	105	56	154	62	368	66	3022	68	3704	66
Aug	114	60	140	45	327	65	2851	72	3484	69
Sep	108	57	99	52	294	67	2757	71	3313	69
Oct	96	55	115	56	382	63	3268	71	3916	68
Nov	132	59	121	56	339	68	3379	74	4018	72
Dec	110	60	109	67	285	74	3032	77	3580	75
Total	1158	56%	1281	55%	3809	66%	33624	71%	40482	68%
% Change Previous Year	+19%		+10%		+ 8%		+ 8%		+ 6%	

TABLE 4

Total Number of Occupants and Percent Wearing Restraint Devices, Casualty Traffic Accidents, British Columbia, 1983

Month	Age Groups									
	0 - 5		6 - 12		13 - 17		18+		Overall	
	# Occ.	% Rest.	# Occ.	% Rest.	# Occ.	% Rest.	# Occ.	% Rest.	# Occ.	% Rest.
Jan	63	51	91	68	190	67	2292	78	2652	75
Feb	80	66	71	65	211	76	2187	80	2570	78
Mar	90	77	76	71	248	74	2245	78	2686	76
Apr	68	73	86	70	284	77	2406	75	2880	74
May	98	68	102	76	274	74	2587	78	3096	76
Jun	116	78	79	68	341	74	2883	81	3460	79
Jul	101	64	142	70	320	82	2830	82	3430	80
Aug	141	77	151	71	340	78	2711	81	3370	79
Sep	123	63	104	79	286	79	2834	82	3373	81
Oct	113	83	102	78	334	75	3002	83	3578	81
Nov	114	78	147	76	342	82	3457	84	4084	83
Dec	130	77	168	75	328	82	3123	84	3775	82
Total	1237	72%	1319	73%	3498	77%	32557	81%	38954	79%
% Change Previous Year	+29%		+33%		+17%		+14%		+13%	

TABLE 5

Total Number of Occupants and Percent Wearing Restraint Devices,
Casualty Traffic Accidents, British Columbia, Jan. 1984-Sept. 1984

Month	Age Groups									
	0 - 5		6 - 12		13 - 17		18+		Overall	
	# Occ.	% Rest.	# Occ.	% Rest.	# Occ.	% Rest.	# Occ.	% Rest.	# Occ.	% Rest.
Jan	83	77	105	68	223	81	2195	86	2619	84
Feb	88	73	87	75	196	78	2206	82	2595	81
Mar	89	76	78	67	221	80	2244	85	2653	83
Apr	78	69	78	81	246	82	2477	82	2906	81
May	137	79	101	76	286	84	2740	85	3281	84
Jun	91	81	110	76	318	77	2800	83	3346	81
Jul	131	79	154	82	302	79	2912	83	3537	81
Aug	121	72	144	69	361	76	3012	81	3663	79
Sep	102	70	99	73	301	85	2843	86	3377	84
Total	920	75%	956	74%	2454	80%	23429	84%	27977	82%
% Change Year to Date	+ 7%		+ 4%		+ 5%		+ 5%		+ 5%	

DISCUSSION

The use of restraint devices in motor vehicles has increased substantially between 1980-1984, especially within the younger age groups, as reflected in occupant restraint device use as reported on Traffic Accident Report Forms (MV104) completed by attending police officers at casualty traffic accidents. To illustrate, between 1980-1984, reported restraint device use increased by 70% for the 0-5 year old group, 57% for the 6-12 year old group, 36% for the 13-17 year old group, and 28% overall. From the MV104 casualty accident reports, the use rates in 1980 vs 1984 for these age groups were as follows: 0 - 5 year old group - 44% vs 75%; 6 - 12 year old group - 47% vs 74%; 13 - 17 year old group - 59% vs 80%; and overall 64% vs 82%. Further, in all years and all age categories examined, use rates were highest in the Winter months and lowest in the Summer months. However, it must be noted that the overall rate of increase appears to be levelling off.

It can be reasonably argued that the increase in use rates that began in late 1981 and has continued to date can, in part, be attributed to increased restraint device use law enforcement and "blitzes", to intensive elementary school programs and to increased public education and awareness campaigns, all assisted by the Traffic Safety Education Department of I.C.B.C. As use rates appear lowest in the Summer, perhaps this would be a particularly appropriate time of year for future enforcement and education campaigns. Finally, as the use rates appear to be reaching a plateau, current enforcement and education efforts must be maintained or even increased.

*Actual use rates determined by observational surveys are, on the average, about 10-15% less than reported casualty traffic accident rates.

Restraint Device Use and Ejection From Vehicle

According to the findings in The Characteristics of Night-Time Drivers in British Columbia (Ministry of Attorney-General, 1982), 59.5% of the drivers stopped and 52.0% of the passengers were found to be wearing seat belts, those wearing seat belts tended to be female, older, going on a longer trip, and having a lower Blood Alcohol Count than those not wearing seat belts. Further, it was found that drivers in the Census Metropolitan Areas (i.e. Lower Mainland and Victoria areas) were more likely to be wearing seat belts than were those in the rest of the province. Unfortunately, the survey design did not allow a break-down of the province into relatively small geographical areas, and thus the restraint device use in different areas could not be compared the one to the other.

Consequently, it is the purpose of this Brief Report to attempt to get some notion of restraint device use across the province by examining victim restraint device use as recorded on all accident report forms (MV104) involving injury or death in 1982. In addition, whether or not victims were ejected from any vehicles in the accident will also be examined. The reasoning here is that if one accepts the premise that the number of accidents where victims are not wearing seat belts and the number of accidents where victims are ejected from vehicles relates positively to the number of persons not wearing restraint devices, then by examining these two variables, one can get a rough notion of the relative differences in restraint device use from location to location. This information in turn could be used to pinpoint geographical locations for restraint device use campaigns, extra police enforcement efforts, and so on.

METHOD

Source of Accident Information:

Accident reports are compiled and put into computer-readable form by the Ministry of Transportation, Communication and Highways, Motor Vehicle Branch, and from this a wide variety of analyses can be done.[1] The sub-set of accidents that this report deals with is that set of accidents involving injury or death. The reason for limiting the sample to this group is twofold: First, it would be very costly in terms of computer time to deal with all reported accidents- in B.C. in 1982 there were 118,147 reported accidents, but only 24,220 (20.5%) involved injury or death. Second, many accidents not involving injury or death are reported by drivers to the police some time after the accident, whereas those involving injury or death are usually attended by police who also fill out the accident report forms (MV104). Therefore, the data from reports completed by the police are likely to be the most valid and reliable.

Analyses:

From the B.C. 1982 MV104 reports involving injury or death two variables were calculated. The first divides accidents into those where a victim was reported as not wearing a restraint device and those where no victim was reported as not wearing a restraint device. The second divided accidents into those where one or more victims were completely or partially ejected from the vehicle, and those where no victims were reported as being partially or completely ejected from a vehicle. In order not to confuse matters vehicles that were not equipped with restraint devices (eg. motorcycles) were eliminated from the sample. Thus, all of the accidents examined involved vehicles that were equipped with restraint devices, although of course, not all victims chose to use them (note: this does not apply to child restraint devices- that is we do not have information on how many of the vehicles were equipped with child restraint devices).

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[1] It should be noted here that information on the M.V.B. computer tapes is constantly being revised and improved by the M.V.B. It follows that the figures drawn from one set of data may differ from figures drawn from an updated data set. Therefore, any figures produced by the M.V.B. after the creation of this data set (February, 1983) which contradict these figures should be considered correct.

These two variables - restraint device use and ejection from vehicle - were then broken down in terms of rural and municipal police reporting subdivisions. Each of these reporting groups in turn is comprised of a number of reporting detachments. For those not familiar with the breakdown of the police reporting groupings, please refer to Appendix A.

RESULTS

Restraint Device Use, 1982:

For accidents involving injury or death in B.C. in 1982, excluding those accidents associated with vehicles not equipped with restraint devices, there were 7075 (39.8%) that had one or more victims reported as not wearing a restraint device. The three police reporting groups that reported the highest proportion of accidents where one or more victims were not wearing restraint devices were: Prince George Municipalities (58.5%), Prince George Rural (58.1%) and Prince Rupert Rural (58.5%). The three police reporting groups that reported the lowest proportion of accidents where one or more victims were reported as not wearing restraint devices were: R.C.M.P. District 1 Municipalities (30.9%), Freeway R.C.M.P. (28.8%) and Vancouver Area Independent Forces (33.0%).

From Table 1 on page 5 one can see that generally the Lower Mainland and Victoria area reported a lower proportion of accidents of this sort than did other areas in the province, while comparing the rural reporting areas with the municipal reporting areas one finds that the municipal areas report a lower proportion of accidents with one or more victims not using a restraint device than did the rural reporting areas. Finally, again from Table 1, it can be seen that in terms of reporting the highest proportions of unrestrained-victim accidents, the top broad geographical regions are Prince George and Prince Rupert, followed closely by the central interior regions associated with Kelowna and Kamloops.

Ejection From Vehicle, 1982:

For accidents involving injury or death in B.C. in 1982, excluding those accidents associated with vehicles not equipped with restraint

TABLE 1
Accidents where 1 or more
Victims not wearing
Restraint Device

Police Reporting Group	Total # Accidents	% Accidents Victim not Restrained
KELOWNA MUNICIP.	747	39.9
KELOWNA RURAL	919	49.7
KAMLOOPS MUNICIP.	462	45.2
KAMLOOPS RURAL	679	53.8
NELSON MUNICIP.	139	44.6
NELSON RURAL	807	52.4
+ PR. GEO. MUNICIP.	562	58.5
+ PR. GEO. RURAL	730	58.1
PR. RUPERT MUNICIP.	183	55.2
+ PR. RUPERT RURAL	381	58.5
- RCMP DIST. 1 MUNICIP.	4981	30.9
RCMP DIST. 1 RURAL	597	39.9
VICTORIA MUNICIP.	439	41.7
VICTORIA RURAL	658	42.9
COURTENAY MUNICIP.	229	41.1
COURTENAY RURAL	635	38.4
- FREEWAY RCMP	455	28.8
- VAN. AREA INDEPENDENT	3009	33.0
VIC. AREA INDEPENDENT	1063	39.8
? NELSON AREA INDEPENDENT	41	22.0
? OTHER POLICE	6	83.5
PROVINCIAL TOTAL	17792	39.8

TABLE 2
Accidents where 1 or more
Victims Completely or
Partially Ejected

Police Reporting Group	Total # Accidents	% Accidents Victim Ejected
KELOWNA MUNICIP.	786	8.4
+ KELOWNA RURAL	956	10.8
KAMLOOPS MUNICIP.	494	9.7
KAMLOOPS RURAL	718	10.3
NELSON MUNICIP.	147	9.0
NELSON RURAL	840	9.2
PR. GEO. MUNICIP.	603	7.5
+ PR. GEO. RURAL	764	12.3
PR. RUPERT MUNICIP.	189	9.5
+ PR. RUPERT RURAL	401	13.2
- RCMP DIST. 1 MUNICIP.	5288	5.2
RCMP DIST. 1 RURAL	643	11.2
VICTORIA MUNICIP.	469	6.0
VICTORIA RURAL	723	8.0
COURTENAY MUNICIP.	313	6.1
COURTENAY RURAL	664	6.5
- FREEWAY RCMP	473	4.0
- VAN. AREA INDEPENDENT	3853	4.4
VIC. AREA INDEPENDENT	1138	9.9
? NELSON AREA INDEPENDENT	41	0.0
? OTHER POLICE	6	16.7
PROVINCIAL TOTAL	19509	7.1

NOTE: ? = numbers too small to interpret
+ = among the three highest
- = among the three lowest

devices, there were 1383 (7.1%) that involved one or more victims being partially or completely ejected from the vehicle. The three police reporting groups that reported the highest proportion of accidents where one or more victims were completely or partially ejected were: Kelowna Rural (10.8%), Prince George Rural (12.3%) and Prince Rupert Rural (13.2%). The three police reporting groups that reported the lowest proportion of accidents where one or more victims were completely or partially ejected from the vehicle were: R.C.M.P. District 1 Municipalities (5.2%), Freeway R.C.M.P. (4.0%) and the Vancouver Area Independent Forces (4.4%).

From Table 2 on page 5 one can see that generally the Lower Mainland area reported a lower proportion of accidents of this sort than did other areas of the province, and, also similar to the pattern found in Table 1, there were rural-municipal differences with rural areas reporting a higher proportion of victim-ejection accidents than municipal areas. Finally, in terms of broad geographical regions, the highest incidence of these accidents was in the Prince George and Prince Rupert areas, followed closely by the Kelowna and Kamloops areas.

DISCUSSION

First, it must be kept in mind that the figures in this study deal with what was reported, not necessarily with what happened. This caution applies particularly to figures on restraint device use, as, generally speaking, the police officer who makes out the accident report form (MV104) arrives some time after the accident and therefore often has to take the word of those involved in the accident as to whether or not restraint devices were used. As it is, in most cases illegal not to be wearing a restraint device, one can speculate that those involved would be motivated to report use when there was none. Also, it may be that, because of the crisis nature of the situation, the attending officer might fail to immediately assess restraint device use. This latter point may help explain why there were more missing data on restraint device use than on ejection from vehicle.

Restraint Device Use:

Keeping in mind the above caution, one can still use these figures to get some idea of the relative use of restraint devices from location to location. As the night-time survey found the highest level of seat-belt use to be in the large urban areas, it is not surprising that this study found the lowest proportions of victims reported as not wearing restraint devices in the relatively urban Lower Mainland Area. On the other hand, it is difficult to speculate as to why there should be such a relatively high proportion of accidents where victims were not wearing restraint devices coming from the Prince George and Prince Rupert areas. Further, within each municipalities/rural grouping, there appears to be consistant differences, with the municipalities reporting a lower proportion of victim-unrestrained accidents than their rural counterparts. This latter point might be explained by one or both of the following: seat-belt use could be higher in municipalities, where perhaps the police are more visible and thus drivers perceive a higher risk of being charged should they not be wearing seat-belts; and/or due to relatively higher speeds and poorer roads, there are more accidents in rural areas where it comes to the attention of the attending officer that a victim was not wearing a restraint device- that is, at higher speeds, it is more likely that a victim not wearing a restraint device will be ejected, and thus will be recorded as not wearing a restraint device. This notion that the extreme municipal-rural differences could be a function of reporting is supported by the figures in Table 2 that indicate a higher proportion of victims ejected in rural as opposed to municipal reporting groups.

Victim Ejection From Vehicles:

The information on whether or not the accident involved a victim being ejected is likely more reliable and valid than restraint device use data, as a victim having been thrown from a vehicle is not so easily missed by the reporting officer or lied about by those involved.

It is not surprising that the patterns in these data are almost identical to those found in the data on restraint device use, as one would certainly expect restraint device use to be related to whether or not one was thrown from the vehicle. As with restraint device use, there were differences between the Lower Mainland and the rest of the province, with Prince George and Prince Rupert areas being at the other extreme. Further, there were also consistant municipal-rural differences, with the rural areas reporting a higher proportion of accidents where one or more victims were completely or partially ejected than did the municipal areas.

GENERAL CONCLUSIONS AND RECOMMENDATIONS

The analyses of those traffic accidents involving injury or death in B.C. in 1982 indicate that in about 40% of the cases one or more victims were not wearing restraint devices, and in about 7% of the cases one or more victims were completely or partially ejected from the vehicle during the accident. Regionally, the Lower Mainland shows the fewest of these sorts of accidents, while the Prince George and Prince Rupert areas show the greatest number, followed closely by the Kelowna and Kamloops areas. In addition, there are fewer reports of these sort of accidents in municipal as opposed to rural reporting groups.

Whether or not these figures closely reflect the actual restraint device use levels in the various reporting areas is questionable. However, the figures in this report do accurately reflect where the problem areas are, that is, where people are being injured or killed. Surely what is needed is not so much knowledge as to the relative extent of restraint device use but rather knowledge as to where the police and public education groups most need to deploy resources in order to most effectively use those resources and thus save lives. After all, the whole point of the matter is to save as many lives as possible with the resources available, and this in turn necessitates an effective allocation of resources by regarding where they will do the most good in terms of saving lives, as opposed to merely increasing average levels of restraint device use over the province as a whole. Consequently, this report recommends:

1. Increased enforcement of restraint device legislation and public education in the Prince George and Prince Rupert areas.

2. Increased enforcement of restraint device legislation and increased public education in rural areas throughout the province.[1]

3. Figures on victim restraint device use and victim ejection from the vehicle during an accident be used in order to measure the effectiveness of those efforts noted above. The use of these measures is not only a very good indicator of program effectiveness in terms of the real goal of saving lives, it would also be extremely cost-effective, as these data are collected on a routine basis and thus would not involve the cost of repeated surveys and the like.

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[1] Footnote: Not to belabour the point, but consider this- there is a generally higher proportion of accidents involving victims being ejected in rural areas than in municipal areas, possibly due to higher speeds in the former. It follows that an increase of, say 10% seat belt use in the rural areas would save more lives than a similar increase in municipal areas, as the liklihood of being ejected from a vehicle (and thus more likely being killed) is less at slower speeds.

APPENDIX A

RURAL/MUNICIPAL/INDEPENDENT/OTHER REPORTING DETACHMENTS

For the purpose of the Motor Vehicle Branch Accident Tape analyses, the following reporting detachments are grouped under the following headings:

RCMP DETACHMENTS

Kelowna Subdivision

Kelowna Rural

Armstrong
Enderby
Falkland
Kelowna Rural
Keremeos
Lumby
Oliver
Osoyoos
Pentiction Rural
Princeton
Revelstoke
Salmon Arm Rural
Sicamous
Summerland Rural
Vernon Rural

Kelowna Municipal

Kelowna Mun.
Penticton Mun.
Salmon Arm Mun.
Summerland Mun.
Vernon Mun.

Kamloops Subdivision:

Kamloops Rural

Alexis Creek
Anahim Lake
Ashcroft
Barriere
Blue River
Chase
Clearwater
Clinton
Kamloops Rural
Lillooet
Logan Lake
Lytton
Merritt Rural
100 Mile House
Spences Bridge
Valemount
Williams Lake Rural

Kamloops Municipal

Kamloops Mun.
Merritt Mun.
Williams Lake Mun.

Nelson Subdivision

Nelson Rural

- Castelyar Rural
- Cranbrook Rural
- Crescent Valley
- Creston
- Fernie
- Field
- Fruitvale
- Golden
- Grand Forks
- Invermere
- Kaslo
- Kimberley Rural
- Midway
- Nakusp
- Nelson
- New Denver
- Radium
- Rossland
- Salmo
- Sparwood
- Trail Rural

Nelson Municipal

- Castlegar Mun.
- Cranbrook Mun.
- Kimberley Mun.
- Trail Mun.

Prince George Subdivision

Prince George Rural

- Burns Lake
- Chetwynd
- Dawson Creek Rural
- Fort Nelson
- Fort St. James
- Fort St. John Rural
- Fraser Lake
- Hudson Hope
- Mackenzie Rural
- McBride
- Prince George Rural
- Quesnel Rural
- Vanderhoof
- Wells
- Watson Lake, Teslin

Prince George Municipal

- Dawson Creek Mun.
- Fort St. John Mun.
- Quesnel Mun.
- Mackenzie Mun.
- Prince George City Mun.

Prince Rupert Subdivision

Prince Rupert Rural

- Atlin
- Bella Coola
- Bella Bella
- Cassiar
- Dease Lake
- Granisle
- Hazelton
- Houston
- Kitimat Rural
- Masset
- New Aiyansh (Pr. Rup.)
- Ocean Falls
- Prince Rupert Rural
- Queen Charlotte City
- Smithers
- Stewart
- Telegraph Creek
- Terrace Rural

Prince Rupert Municipal

- Kitimat Mun.
- Prince Rupert Mun.
- Terrace Mun.

Lower Mainland Subdivision (District 1)

Lower Mainland Rural

- Abbotsford Rural
- Agassiz
- Boston Bar
- Chilliwack Rural
- Coquitlam Rural
- Haney Rural
- Hope
- Gibsons
- Maple Ridge Rural
- Mission Rural
- Sechelt
- Squamish Rural
- University
- Pemberton
- Whistler
- Vancouver Bowen Island

Lower Mainland Municipal

- Abbotsford Mun.
- Burnaby
- Chilliwack Mun.
- Chilliwack Township
- Coquitlam Mun.
- Haney Mun.
- Langley City Mun.
- Langley Township Mun.
- Maple Ridge Mun.
- Mission Mun.
- North Vancouver City
- North Vancouver District
- Port Coquitlam
- Richmond
- Squamish Mun.
- Surrey
- White Rock

Victoria Sudivision

Victoria Rural

Colwood
Duncan
Gabriola Island
Ganges
Ladysmith
Lake Cowichan
Nanaimo Rural
Pender Island
Shawnigan Lake
Sidney Rural
Sooke

Victoria Municipal

Chemainus
Duncan-N. Cowichan Mun.
Nanaimo Mun.
Sidney Mun.

Courtenay Subdivision

Courtenay Rural

Alert Bay
Campbell River Rural
Courtenay Rural
Gold River
Parksville
Port Alberni Rural
Port Alic
Port Hardy
Port McNeill
Powell River Rural
Quadra Island
Sayward
Tahsis
Tofino
Ucluelet

Courtenay Municipal

Campbell River Mun.
Comox Mun.
Courtenay Mun.
Port Alberni Mun.
Powell River Mun.

Freeway RCMP

Unit A Freeway
Unit B Freeway
Unit C Freeway

INDEPENDENT DETACHMENTS

Vancouver Area Independents

Delta
Matsqui
New Westminster
Port Moody
Vancouver City
West Vancouver

Victoria Area Independents

Victoria City
Saanich
Central Saanich
Esquimalt
Oak Bay

Nelson Area Independents

Nelson

OTHER POLICE

National Hbrs. Brd. Police
C.N.R. Police Vancouver
C.P.R. Police Vancouver
BCHP 2nd Narrows Bridge
BCHP Lions Gate Bridge
BCHP Port Mann Bridge
BCHP Oak St. Bridge
BCHP Middle Arm Bridge
George Massey Tunnel
Tsawassen Terminal
Swartz Bay Terminal
Horseshoe Bay Terminal
Departure Bay Terminal
Langdale Terminal
Military Police

A Note on the Effectiveness of "80% Clicks"

A NOTE ON THE EFFECTIVENESS OF "80% CLICKS!"

The CounterAttack Brief Report #9 Trends in Restraint Device Use of Occupants in Injury/Death Traffic Accidents, British Columbia, January 1977 - June 1983 (Ministry of Attorney General, October 1983) notes the monthly proportions of occupants reported as wearing restraint devices by the police officer attending the accident as recorded on the Traffic Accident Report Form (MV104). Using these monthly figures from January 1979 to April 1983 in conjunction with the Box-Jenkins* projection technique, one finds that, at a 95% confidence level, the expected proportion of occupants reported as wearing restraint devices for May 1983 was 72% with a lower limit of 66% and an upper limit of 77%, while for June 1983 the projected figure was 69% with lower limit of 63% and an upper limit of 74%. The observed proportions for May and June were 76.3% and 79.2% respectively.

The fact that the observed May proportion of restraint device use is near the upper limit of the projected May confidence limit and that the June observed proportion is above the projected June upper limit may in good part be explained by the "80% CLICKS!" enforcement and media campaign to encourage restraint device use that was undertaken from May 20 to June 4 by both the police in British Columbia and by the Insurance Corporation of British Columbia*.

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*FOOTNOTE: One degree of seasonal differencing, one degree of non-seasonal differencing, 12 month period, origin -48, moving average technique.

It is difficult at best to try to isolate the effects of these sorts of campaigns, and harder still to translate these effects into dollar value. However, it might be useful to make a conservative and qualified attempt.

Considering only the month of June, where the observed proportion of restraint device use among occupants of injury/death traffic accidents is statistically significantly greater than what one might expect (i.e., the observed value is greater than the upper limit of the expected value), one finds that the difference between observed and most likely expected values is 10% (i.e., 79% - 69%). That is, there were 10% more occupants who were in serious accidents who were wearing restraint devices than one would have expected. As there were 3,444 occupants of vehicles in injury/death accidents where the vehicles were equipped with restraint devices, 10% of these or about 344 more occupants were wearing restraint devices than one would expect.

*This campaign is well documented in 80% CLICKS! Project, available through the Insurance Corporation of British Columbia.

If one assumes that restraint device use is only 30% effective in reducing injury, then one might speculate that about 103 occupants (i.e., 30% of 344) were saved serious injury through this increase in restraint device use. If one further assumes that each traffic accident injury claim costs ICBC about $10,000, then these 103 occupants using restraint devices represent a saving of $1,030,000 to the insurance company for the month of June.

Ignoring any long-term effects and looking at June alone, one might suggest that, at a cost to ICBC of about $90,000, the "80% CLICKS!" program was cost-effective. Even if the above calculations are wrong by a magnitude of 50%, one still finds a cost/benefit ratio of about 1/5. In short, the "80% CLICKS!" program very likely increased restraint device use, reduced injuries, and saved money.

APPENDIX A

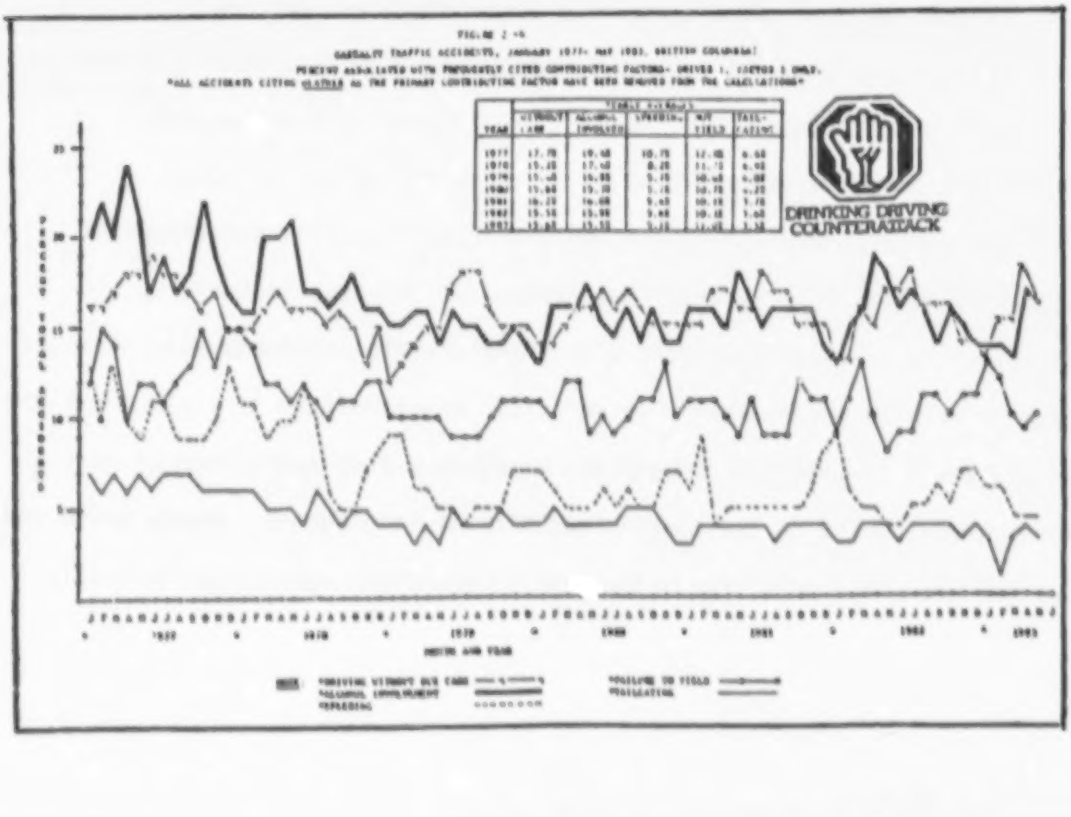
Executive Summary of Alcohol-Related Casualty Traffic Accidents
in British Columbia, Ministry of Attorney General,
British Columbia, 1984

EXECUTIVE SUMMARY

The Costs:

Within the last six and one half years in British Columbia at least one thousand, six hundred and thiry-one people have been killed and forty-six thousand, seven hundred and thirty-nine have been injured in traffic accidents caused primarily by drinking drivers. In 1982 alone, accidents associated with drinking driving cost the provice at least one hundred and four million dollars in insurance claims, medical claims and Justice System costs. Regarding the burden on the Justice System, in 1982, about 30% of the persons charged by the police under the Canadian Criminal Code, 30% of the completed Criminal Code cases in the courts, and 34% of the admissions to correctional institutions were Driving While Impaired charge related. Arguably, drinking driving extracts more costs from society than does any other single behaviour.

Measurement and Trends:



Section I on the measurement of and trends in factors contributing to casualty traffic accidents suggests that:

1. Measurement of the causes of these accidents is difficult at best, but using the contributing factor codes from the Traffic Accident Report Form (MV104) completed by the attending officer at all casualty accidents is reasonably reliable and acceptably valid approach.
2. An examination of all contributing factors to these casualty accidents reveals that Driving Without Due Care is the most frequently cited factor, with Alcohol Involvement, Unsafe Speed and Failure to Yield Right of Way all at about the same level as the second most frequently cited factors.
3. Since 1977 the proportion of alcohol-related casualty accidents has decreased by about 10% and has been stable for the past three years, while the actual likelihood of being charged with Driving While Impaired has decreased from 1977 levels.
4. Alcohol-related casualty traffic accidents show seasonal variations, being least frequent in December-January and most frequent in the Spring and Summer.

Location and Circumstances:

Not surprisingly, Section II on the location and circumstances of alcohol-related casualty traffic accidents illustrates that the contributing factors associated with these traffic accidents vary with the general driving environment - in municipal areas Failure to Yield the Right of Way and Following too Closely are cited more frequently than in more rural areas, while in the rural areas Alcohol Involvement, Unsafe Speed and Weather are cited more frequently than in municipal areas. Additionally, Following too Closely is cited as a contributing factor frequently on freeways, while Driving Without Due Care is cited with about the same frequently in municipal as in rural areas.

In addition, when compared to the non-alcohol related accident, alcohol-related accidents were more likely to have:

1. Been a single-vehicle accident where the driver lost control of the vehicle, ran off the road, and hit an object at the side of the road.
2. Occurred late in the week, late in the day, and in the Spring as opposed to the Winter.
3. Occurred on a more-or-less nondescript portion of the road, between intersections, with no traffic control devices in the immediate area (because none are needed). The land use in the area was likely to be a Family/Residential or an Agricultural/Undeveloped area, although campgrounds and recreational areas also had a high proportion (but low absolute number) of alcohol-related accidents. Posted speed zones did not show any particular patterns with regard to these sorts of accidents.
4. Occurred in high proportions in good driving weather and good road conditions and in low proportions in bad conditions and bad weather. While high proportions of alcohol-related accidents were associated with "dark" (i.e. night) conditions, good ambient lighting did appear to reduce these proportions.
5. Occurred in curved road sections as opposed to straight sections, while road grade and surface composition did not appear to appreciably affect alcohol-related accidents.

The exceptional thing about the situational characteristics of alcohol-related casualty traffic accidents is that there are very few situational variables that can be pointed to in order to either explain or combat these accidents. It would seem that the drinking driver simply drives off the road when the road curves and hits an object off the road. The weather, road conditions, road surface, traffic control devices, posted speed zones, land use areas and so on are all either better than average for driving or make no particular difference one way or the other to the likelihood of the alcohol-related accident. Arguably, better lighting conditions and better barriers at road sides (especially at curves) might reduce these accidents, as might stronger enforcement efforts late at night, late in the week, and during the Spring. However, by elimination of the largely situational variables, one is left with the unavoidable conclusion that the primary precipitator and cause of these accidents is the inability of the driver to handle the vehicle after drinking. Unfortunately, the driver is the most difficult variable to change.

The Drivers - Alcohol, Age, Experience:

In Section III on the drivers in alcohol-related casualty accidents, it is shown that drinking drivers have Unsafe Speed, Driving Without Due Care, Driving on Wrong Side of Road and Fell Asleep cited as contributing factors to casualty accidents more often than do sober drivers, while they have factors associated with their behaviour toward other drivers (e.g. Failure to Yield Right of Way, Following too Closely) cited less frequently than for sober drivers. This latter finding probably reflects the high (58.0%) frequency of single-vehicle accidents associated with alcohol, as noted in Chapter Six. Further, Driver Inexperience is cited less frequently as a contributing factor for drivers who were thought to have been drinking than for those who were thought to be sober.

The finding noted in Section II that alcohol-related accidents do not seem to be associated with adverse environmental conditions (e.g. rain, fog, etc.) is supported by the finding in this section that conditions-related contributing factors are underrepresented in casualty accidents involving drivers who were thought to have been drinking. Further, not only can the drinking driver not pass off the responsibility for the accident on the driving conditions, that driver also cannot blame the vehicle condition, as the majority of vehicle-fault factors are underrepresented for drinking drivers in casualty accidents.

Thus, from the findings in Section III one obtains the strong impression that drinking drivers in casualty accidents are, as a group, both personally and socially irresponsible: they become physically impaired and drive by choice and thus show their irresponsibility and contempt for the law; once driving, they are both careless and tend to speed, again showing personal and social irresponsibility. Certainly, the effect of the consumed alcohol reduces their ability to drive, but it can be argued that it is not the alcohol *per se* that is the really primary contributing factor, but rather the irresponsible personality that chooses to drink and drive, to drive carelessly, and to speed. In short, the problem rests at least as much with the individual's personality as it does with effects directly attributable to the physiological influence of the alcohol consumed.

Further, with regard to the relationships among driver age, driver experience, and alcohol-related casualty accidents, Section III shows that:

1. More than any other factor examined driver age contributes most to the

likelihood of being in a casualty accident. That is, the younger the driver, the more probably the driver will be in a casualty accident:

2. The highest relative proportion of registered drivers in alcohol-related casualty accidents occurs in the 19-year old group, with this proportion decreasing for both younger and older drivers. As 19 years of age is the first time persons in B.C. can legally acquire alcohol, there may be a causal relationship between this legal access and alcohol-involved accidents;
3. For the 16-22 year old group of drivers, extent of driving experience did not relate systematically to being in an alcohol-related casualty accident.

From these findings one concludes that age alone is the best predictor of crash risks and that legal access to alcohol is the best predictor of alcohol-related crash risks, while years of driving experience do not related in any systematic fashion to alcohol-related crash risks.

Recommendations:

From Section 1 on the measurement of and trends in alcohol-related casualty traffic accidents, one can recommend that:

1) While public education programs such as CounterAttack are doing a fair job of keeping the problem of drinking drivers under control, and indeed work quite well during the "blitz" Winter times, more effort needs to be put into education and enforcement at peak alcohol-related accident time of early Spring and Summer; and
2) It would be worthwhile to broaden public education and enforcement campaigns to include speeding and failure to yield.

Broadly speaking, from Section II on the location and circumstances of these accidents, two recommendations can be taken:

1. Enforcement Resources and public education efforts need to be distributed in terms of the types of contributing factors associated with different locations. For example, it would make more sense to increase enforcement on Failure to Yield Right of Way (provincially cited in 16% of the accidents) in the Vancouver area (locally cited in 23% of the accidents) than to crack down on Following too Closely (provincially cited in only 7% of the accidents) in the Prince Rupert area (locally cited in only 3% of the accidents).
2. As it seems to be the driver not the circumstances that precipitates alcohol-related casualty accidents, then a focus on the driver and driver education would seem to be the route to take in order to reduce these accidents.

From Section III on the drivers, it seems reasonable to suggest that while further restricting access to alcohol would probably reduce alcohol-related accidents for that group affected, and would also probably marginally reduce the absolute number of accidents, a more effective approach to reducing young driver traffic accidents would involve limiting driving privileges for younger drivers. This would substantially reduce both alcohol-related and non-alcohol related accidents both for the age group affected and for the population generally, as age is the very best overall predictor of crash risks.

Finally, while there is much still needed to be done, it should be remembered that some few inroads have been made toward reducing alcohol-related casualty accidents in British Columbia. To place the reduction of these accidents noted in Chapter Four into perspective, if one assumes that in each year from 1977 alcohol-related casualty accidents have been no more than 90% of the frequency that one might expect had there been no prevention programs, then one can calculate that between 1978 and 1982 inclusive, 146 deaths and 4,246 injuries have been avoided, which translates into a cost saving of about $43,920,000 to the Insurance Corporation of British Columbia alone, based on the I.C.B.C. cost estimate of $10,000 per injury or death.

NOTES